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BRITISH MEDICAL JOURNAL

LONDON SATURDAY JULY 19 1941

PROBLEMS OF THE CIRCULATION*

BY

R. J. S. McDOWALL, M.D., D.Sc.

Professor of Physiology, King's College, University of London

Capacity of the Circulation

One of the greatest advances in regard to the circulation in the last twenty-five years has been the recognition of its variable capacity. It had long been recognized clinically that circulatory collapse might occur from the rapid removal of a large amount of fluid which had been compressing vessels in the chest or abdomen, or from excessive dilatation of the skin vessels by heat. It was recognized, too, that the cross-area of the open capillary bed, and therefore its capacity, was enormous; but not until the work of Dale and Richards (1918) and of Krogh (1918-19) was it realized that by far the greatest number of the capillaries in the body are not usually open, that they only dilate when local metabolic needs demand a greater supply of blood, and that a generalized opening leads to the capillaries' soaking up the blood like a sponge, with the result that circulatory failure occurs from a failure of the blood to return to the heart. This occurs when the capillaries dilate as a result of the action of toxins like histamine, or when there is loss of the nervous control of the blood vessels of a sufficiently large area.

The treatment of the condition when it occurred or was thought to have occurred clinically was obviously the supply of additional blood or blood substitutes to the circulation. The problem is not, however, quite so simple; for dilated capillaries are abnormally permeable—as we see typically in pleurisy with effusion—and allow the albuminous fluid of the blood to pass into the tissues in abnormal amounts. The use of blood has the advantage that its corpuscles convey the oxygen and assist in carbon dioxide removal, which is so vital for the prevention of generalized and fatal asphyxia; but the relatively low osmotic pressure of blood allows the passage of fluid through the dilated capillaries to continue. Various attempts have been made to supply more concentrated fluid. Gum-saline of a higher osmotic pressure than blood was eventually recommended (Erlanger and Gasser, 1919) as an improvement on the 6% solution originally advocated by Bayliss and made the subject of these lectures in 1918.

This problem was also made the subject of an Oliver-Sharpey lecture by Dale in 1923.

The availability of large numbers of blood donors has made possible the provision of concentrated or dried blood plasma or blood serum, which may be used in whatever concentrations are desired. These substances have the advantage that by their osmotic action they withdraw some of the fluid which has seeped through the capillary walls.

In actual practice these fluids are of special value in all varieties of haemorrhage in which there is not an increased capacity of the circulation but a diminution as a result of the constriction of vessels by the vasomotor centre, which compensates so far as possible for the loss of blood. When there is an increased capacity of the circulation there is good evidence, as indicated in the next section, that the problem is by no means so simple as originally supposed, but it has been demonstrated, largely as a result of the work of Blalock (1931), that fortunately many cases of low blood pressure which were thought to be due to increased capacity of the circulation are in reality due to concealed haemorrhage.

The Peripheral Resistance

It has long been understood that without resistance to the outflow of blood from the arteries and elastic vessels a diastolic blood pressure would not be maintained. In these days of war we see the similar necessity for a nozzle on a fire hose if we are to obtain a constant jet of water during the time the pump is filling. Before 1918 it was taught in regard to the circulation that since the cross-area of the circulation was so large the peripheral resistance was located solely in the arterioles.

The recognition of the fact referred to in the previous section, that the majority of capillaries were normally not open but closed, led to other considerations, and Dale and Richards (1918) emphasized that a fall of peripheral resistance was in part responsible for the fall of arterial pressure due to histamine. It was amply confirmed by Hemingway and McDowall (1926) and by McWhan and McDowall (1937) that histamine caused a fall of peripheral resistance accompanied by increased venous outflow in limbs perfused with saline solutions.

This factor of the fall of peripheral resistance has been largely ignored in treating cases of low blood pressure because, as has been said, a generalized dilatation of blood vessels, whether produced as a result of loss of nervous activity by asphyxial products or by other toxins such as histamine acting directly on the capillaries, greatly reduces the return of the blood to the heart and masks the effects of the fall of peripheral resistance so far as venous return is concerned. The importance of this fall of resistance becomes apparent only when an attempt is made to bring about a recovery of the arterial blood pressure by the injection of blood or a blood substitute. Experimentally by a simple model, or by animal experiment, it is easy to demonstrate, since it is a simple fact of hydrostatics, that if the peripheral resistance is reduced it is not possible to cause a return of the arterial pressure to normal without at the same time producing a considerable rise in venous pressure. The most convincing experiment in relation to the problem is to study the effect of the injection of fluid into the circulation after section of the spinal cord high up. This section brings about a generalized dilatation of vessels, resulting in a fall of arterial and venous pressures. If an attempt is now made to return the blood pressure to normal by the injection of fluid the result is a complete failure, because there is not only an increased capacity but also a fall of peripheral resistance. In spite of a maximum output of the heart, enough fluid cannot be pumped out to maintain a high arterial pressure when the peripheral

* The second Oliver-Sharpey Lecture to the Royal College of Physicians of London, 1941.

resistance is so low. The example taken is an extreme case which rarely occurs, but it serves to indicate a point that has been commonly overlooked. It is as if we attempted to produce a jet from a hose without a nozzle by working the pump to the maximum of our ability. In the case of the circulation the venous pressure rises enormously, and this cannot be without importance, for it must be followed by all the sequelae which result from venous congestion. Further, the capillary pressure will be raised, and this will promote still further the seepage of fluid from the blood into the tissues—a fact which is especially important in relation to the lungs and pericardium.

How to restore the peripheral resistance once it has fallen becomes a subject of major importance, for often the patient dies in spite of all treatment. The difficulty is that we know of no drug which will constrict all the blood vessels in the body without impairing the heart. Drugs such as adrenaline, ephedrine, and pituitary extract merely drive the blood from the blood depots into the muscles, and their action is quite short-lived. Adrenaline and ephedrine exhaust the heart, and if continued may, as shown by Freeman (1933), of themselves bring about a fall of arterial pressure, it is thought, through causing asphyxia of the areas they shut down. Pituitary extract acts dangerously on the heart. Barium is too toxic. The preparation veritol β(*p*-oxyphenyl-isopropylmethylamine) is probably the best, but its success has not been very great. It may be that a more suitable drug or combination of drugs will be discovered, but meantime it is as elusive as the philosopher's stone. One of the greatest difficulties in the problem is that in very few instances is any attempt made to diagnose accurately the cause of the fall of blood pressure which goes under the general name of shock, and until this is done as a routine there will be confusion between those cases in which there is a fall of peripheral resistance and those in which there is simple loss of circulating blood.

When possible we have to try to prevent the occurrence of the fall of arterial pressure, and a complete knowledge of how this may be brought about is of the utmost importance. I have already discussed this in a recent lecture given to the Royal College of Surgeons (McDowall, 1940).

The Problem of Fainting

Fainting, although quite a common phenomenon, offers a number of interesting problems. It occurs when the arterial pressure falls, and especially when it falls rapidly. There is no hard-and-fast line between the unconsciousness of fainting and that of shock, into which it may merge as in haemorrhage, but it is convenient to consider fainting as an evanescent phenomenon. Falls of blood pressure occur in cardiac impairment and from dilatation of vessels, separately or combined. A vessel dilatation which commonly produces an evanescent unconsciousness is the result of excessive external heat and toxins—notably that of influenza—which impair the vasomotor system. In the latter case the fall of arterial pressure through failure to adapt to the erect posture may be very considerable. The failure of the vasomotor system may be the result of fatigue of the system, as is seen in the fainting of soldiers on parade or lining the streets—especially on a hot day.

Since consciousness depends on the amount of oxygen supplied to the cerebrum, any state which impoverishes the oxygen-carrying power of the blood must increase the liability to fainting: of these, haemorrhage—notably menstruation—and anaemia are the most common. Muscular exercise, by opening up the vessels of the muscles, may in such persons produce fainting. A similar type of fainting may occur from sudden removal of pressure on vessels in the chest or abdomen. Interference with the pulmonary circulation also causes fainting. This may be the result of the pooling of blood in the chest or of the excessive negative pressure of whooping-cough; it may also be caused by compression of the pulmonary vessels from excessive intrathoracic pressure produced by severe expiration with the glottis closed, as in straining at stool.

Fainting is not, however, confined to those who have any apparent circulatory deficiency, and may, as is well known, be produced psychologically—the psychologists would have us believe as a mental escape from environment from which physical escape is impossible. Lewis (1932) has described the phenomenon as a vasovagal syndrome because it is associated with a fall of blood pressure and slowing of the heart, it is presumed from an increase in the depressor reflexes. It would, however, be much better to look upon the condition essentially as a release phenomenon, the result of sympathetic paralysis or inhibition; for section of the sympathetic produces a similar result experimentally. One of our problems is whether the unconsciousness is in part the cause of the fall of pressure, for there is increasing evidence that sympathetic activity is much more related to the activity of the cerebral cortex than hitherto supposed. Since, however, unconsciousness produced in other and diverse ways does not necessarily result in such a marked fall of arterial pressure, it would seem that by some unknown means the psychological state affects sympathetic centres and that the unconsciousness is produced secondarily.

The well-known fact that the vessels of the skin are intensely constricted offers many problems. It is generally agreed that the fall of blood pressure is due to a dilatation of vessels somewhere, but evidence as to which vessels are dilated is somewhat circumstantial, and is assumed from the persistence of the fall of blood pressure after atropine has been given to prevent the cardiac slowing. The best direct evidence on the point is possibly that of John Hunter, who one day, when bleeding a patient, observed that the venous blood turned bright red just before the patient fainted. Since the skin vessels were presumably constricted we must conclude that there was a dilatation in the vessels of the muscles. The fact that the heart is slowed as a result of increased vagus action would also lead us, as suggested by Lewis, to conclude that the vascular component of the depressor reflexes, which, like the cardio-inhibitory reflex, is activated from the carotid sinus and cardio-aortic region, is also increased. This would bring about a generalized dilatation of vessels. If this explanation is correct it is difficult to understand why the skin vessels escape this general dilator reaction, for all experimental work goes to indicate that the skin vessels take part in the dilator reflexes from the aorta and carotid sinus. It may be that the vessels of the skin are differently controlled—perhaps they respond specially to a fall of internal pressure. Actually, as has been said, skin vessels respond to adrenaline differently from those of muscle, but the acute fall of blood pressure and the slowing of the heart preclude the possibility that adrenaline is concerned in the reaction. However it is produced, it must always be considered possible that the skin constriction is part of a hitherto undescribed defence reaction, of which immobility, simulating death, is a part. Such reactions are common among the lower animals.

High Blood Pressure

No consideration of the problems of the circulation would be complete without reference to high blood pressure, and its importance cannot be overestimated, especially at a time when too many public men are apt to be its victims. The subject has been set out by a very large number of writers for many years, and I shall not attempt to do more than give a survey of the problem as it now

appears to stand. Most valuable details on the subject have been published by Dawson (1925), who emphasized the mental factor; by de Wesselow (1934), who gave a most exhaustive review of the associated chemical changes; and by Pickering (1939), who has made extensive experimental studies of cases.

For the most part the problem now centres round the question of how the increased peripheral resistance is produced, but in regard to this there has unfortunately been a distinct tendency for those interested to take sides. Some suppose a neurogenic hypothesis, and others a chemical one in spite of the fact that admittedly the high blood pressure may be produced from a variety of causes and may be but a common symptom. Further, the two hypotheses are not so mutually incompatible as at first sight appears.

There are certain incontrovertible facts which seem to be, but may not be, relevant. High blood pressure occurs in the following conditions: mental stress, severe exercise, adrenal tumours, nephritis, gout, eclampsia, chronic lead or alcohol poisoning. Experimentally, temporary rises may be produced by stimulation of sensory nerves, of the sympathetic direct or through the vasomotor centres, by oxygen want or accumulation of carbon dioxide, and by the injection of extracts of the adrenal, the pituitary, the cortex of the kidney known as renin (Pickering and Prinzmetal, 1937; Tigerstedt and Bergman, 1898), and of certain pressor amines (Barger, 1914). It may also occur in suitably rested animals as an overcompensation to the injection of depressor substances such as histamine (McDowall). A persistent rise of pressure may also be produced experimentally by partial occlusion of the renal arteries (Goldblatt, Lynch, Hanzal, and Summerville, 1934). This fact, together with the occurrence of high blood pressure in nephritis and the presence of a pressor substance (renin) in the kidney, has caused an undoubted and justifiable bias of opinion towards the view that the kidney is somehow concerned; but, in spite of most painstaking endeavour, conclusive evidence regarding the exact factor concerned is lacking. No pressor substance has been demonstrated in the blood of patients suffering from any variety of high blood pressure. It cannot be dialysed out, nor has the injection of large quantities of blood from patients into normals any effect (Pickering, 1935-6; Prinzmetal, Friedman, and Rosenthal, 1936). That, however, is not to say that no pressor substance is present, but merely that the means of testing for it are inadequate. It may be that the pressor substance is present only in very small amounts but that its effects are cumulative on the arterial wall. It should, however, be pointed out that no substance having such an action has yet been discovered. Further, it is possible to inject into animals a dose of adrenaline or pituitary which will constrict the skin very considerably yet be insufficient to raise the blood pressure. The blood pressure is really too crude a criterion of the existence of small doses of a pressor substance. It is also possible that normal subjects are more capable of destroying the chemical substance than those with hypertension, and therefore it is not possible to demonstrate the action of the pressor substance on the normal circulation. It is possible to carry this idea still further and to reverse the usual chemical conception of hypertension and suggest that the primary fault is failure to destroy a pressor substance which may exist normally in the blood or be liberated as a result of some pathological process. The view, however, has considerable experimental support, for the blood of hypertensive dogs has been found to be more pressor if the kidneys of a recipient dog are removed, and may explain why it is that removal of one kidney in man may occasionally result in a rise of blood pressure, and why the blood of hypertensive patients may have no effect on normals. Already, too, there is evidence that extracts of normal kidney may be of benefit in certain cases of high blood pressure (Grollman *et al.*, 1940; Page *et al.*, 1941). There can be little doubt that the study of experimental hypertension produced by compression of the arteries is of very special importance. It indicates, for example, that it is possible to produce a persistent high blood pressure of renal origin although there is no evidence of renal disability from a study of the urine. The differentiation between so-called essential hypertension and that of chronic nephritis may therefore be quite artificial and only a matter of degree of kidney damage.

The Nervous Hypothesis of Hypertension

Those who support the nervous hypothesis have likewise, or even more so, failed to produce conclusive evidence. There seems to be little doubt that hypertension in man is a disease of civilization. It is stated to be absent among lazy African natives, and affects in a remarkable degree some of the most active persons of our time, but statistically accurate data on this subject are difficult to obtain. That certain families have a tendency to the condition has been noted by many observers. Dawson, however, suggests that the high blood pressure is not produced by striving, but that an existing tendency or trait is made manifest by striving. It is easy to imagine that sustained mental stress would bring about constriction of the peripheral vessels, and many anxious patients appear to be in such a state. Such stress is, however, accompanied by cardiac acceleration. Some observers have found that as a rule the blood pressure is appreciably less in patients examined at home than in the same patients examined in the clinic, and there can be no doubt that blood-pressure readings are of no value unless the patient is in a state of mental quiet and is quite familiar with the application of the sphygmomanometer armlet, etc. The effect of mental factors appears to be indicated by the fact that in some patients a large dose of a sedative may reduce the pressure and in some there is an increased metabolic rate. This would suggest that a general increase in sympathetic activity occurs, and in this connexion it is of some interest to note that very high blood pressures are common in male cats during the spring sexual season—when the sympathetic is very active (Armitage, McDowall, and Mathur, 1932). On the other hand, there is no evidence of a general increase of sympathetic activity which would produce a rapid heart rate, a dilated pupil, or sweating.

We have therefore to ask ourselves, Can mental stress produce more remote effects on the circulation? There are several possibilities. That which since the time of Savill has received most attention is the possibility that frequent use of the arterial muscle may lead to its hypertrophy and that as a result the lumen becomes narrowed. Several workers have attempted to repeat the observation of Savill's —that the muscle of the media of the arterial wall was hypertrophied—with varying results. The difficulty is that of deciding when hypertrophy of arteries of different sizes is present. The possibility that hypertrophy actually interferes with function has also been considered by some to be difficult to imagine; but such a state has been shown to exist in the hearts of racing greyhounds, in which cardiac hypertrophy inside a relatively fixed pericardium may lead to cardiac impairment, which is relieved by slitting of the pericardial sac (O'Shaughnessy).

Pickering (1935) and Prinzmetal and Wilson (1936) claim to have negatived the nervous hypothesis by finding that hypertensive subjects showed no greater increase than normals of the blood flow through the hand when its vasomotor control was removed by raising the body temperature. How far this conclusion is valid is, however, a little uncertain. It excludes certainly any of the immediate

effects of increased sympathetic action, which, as has been said, are already probably eliminated by the absence of a fast heart, but it does not exclude the possibility of hypertrophied arteries, which could still dilate to loss of vasomotor control or to suitable chemical stimuli. In regard to this latter point it ought to be mentioned that a fall of arterial pressure does not necessarily mean that the vessels concerned in a high blood pressure have dilated. Histamine or amyl nitrite, for example, may lower the blood pressure in hypertensive patients by dilating the capillaries and producing capacity effects; indeed, histamine is known to lower arterial pressure while actively constricting arteries. The finding that certain vasodilator drugs lower the blood pressure in cases of hypertension is of no significance in relation to the problem.

It should be pointed out that Oliver (1896), who gave extensive study to the problem, was quite familiar with the fact that the radial artery in patients with high blood pressure caused by chronic nephritis reacted quite normally to changes in posture. It was more constricted when the subject was standing than when recumbent. He, with his arteriometer, examined a number of persons who suffered from periodic attacks of high blood pressure, and found that in these the postural variations in radial calibre disappeared, although between the attacks they were quite normal. He considered, however, that the size of the lumen of the radial artery usually depended on the blood pressure, but pointed out that in all cases of hypertension the lumen of the artery diminished in size progressively.

Another possibility is that the kidney is particularly affected by mental stress; but while there is such confusion regarding the function of nerves on the kidney it is difficult to go further than to mention it. It is possible, too, that the mental stress, by interfering with digestion, which it does admittedly, or with the metabolism, may lead to toxic changes.

Thus it becomes evident that the nervous and chemical hypotheses may yet be brought together; and, in any case, it is not sufficient to say that the kidney or any other organ is at fault without at the same time considering why it is at fault.

Conclusion

In closing these lectures I cannot but plead for the closer relation between physiology and medicine which these lectures were designed to promote. I trust the necessity for this has been evident from what I have said. More will agree that it is needed than did in Oliver's time, but too often the statement is but a pious expression of opinion to which no effect is given. There are still too many who are satisfied with the diagnosis and treatment of disease according to recognized formulae and who are not interested in the progress of their subject. Would that the spirit which imbued Oliver were more prevalent; but may we hope that those who plan the medicine of the future will have vision beyond the immediate needs of the patients, and will organize so that medical research will be as much a routine as is treatment.

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THE INCIDENCE OF DYSPEPSIA IN A MILITARY HOSPITAL

BY

JAMES H. HUTCHISON, M.D., M.R.C.P., F.R.F.P.S.

Major, R.A.M.C.

The occurrence of dyspepsia in the Army during the present war has proved to be one of the major medical problems. Several investigations have been recorded in which the incidence of the various causes of dyspepsia has varied considerably. Payne and Newman (1940) reported that 60% of 287 patients, many of whom were evacuated to England from the B.E.F., had duodenal ulcer. This finding has been criticized by Hartfall (1941) and Spillane (1941) as not being consistent with their experience among soldiers serving in this country. Two factors may explain this discrepancy: Payne and Newman's cases included many from the B.E.F. which had been carefully selected by C.C.S.s and base hospitals in France as likely to be instances of organic disease; and there can be little doubt that in the early days of the war many men who had been suffering from peptic ulcer for some years in civil life were mobilized—for example, reservists and volunteers with special training allowing of their rapid dispatch to France. Presumably most of these men have now been discharged from the Army by medical boards, and it might be expected that the incidence of organic dyspepsia among troops would consequently be lower than in the early months, especially as civilian medical boards examining recruits are more aware that ulcer cases do not do well under military conditions.

Saffley (1941) reports that of 320 soldiers investigated radiologically 50.3% were "normal" and 38.7% had peptic ulcers. He also states that of 338 cases of dyspepsia in a near-by military hospital from which he drew his patients no lesion was found in 124, ulcers were present in 133, and the remarkably high proportion of 38 cases were diagnosed as anxiety neurosis. Working in another military hospital, I have not found this high incidence of neurosis, and the psychiatrist there has informed me that few cases of neurosis passed on to him have symptoms referred to the gastro-intestinal organs. On the other hand, the occurrence of peptic ulcer among all cases of dyspepsia referred to this hospital has been considerably less than that found by Payne and Newman (1940) in cases evacuated from the B.E.F. It was therefore deemed worth while to publish the incidence of the various types of dyspepsia investigated by us during a period of four months—November, 1940, to February, 1941—especially as these were cases sent "direct" from units in the area.

Method of Approach

In the vast majority of instances the question to be answered was, Is there or is there not an active ulcer present? A summary will therefore be given of our method of approaching a possible case of ulcer dyspepsia, and of the basis on which the diagnosis was made. This will be followed by a detailed account of all types of cases and by a discussion of further points in differential diagnosis.

Most of the cases of dyspepsia referred to this hospital were first seen at the out-patient clinic, where the history was taken and a careful clinical examination was made. With few exceptions investigation by fractional test meal (F.T.M.) was then carried out in the out-patient department by appointment, unless it was at once obvious that

the condition was not ulcer dyspepsia, or if documentary evidence was forthcoming that the soldier had been adequately investigated elsewhere within the preceding three months. If the history, clinical findings, and result of the F.T.M. were suggestive of ulcer the case was put on the waiting list and hospital investigation arranged within a week or two, either here or in a neighbouring civil or E.M.S. hospital. Some patients—e.g., those with bleeding ulcers, men over 40 years with a short history, and men who appeared ill and in pain—were admitted direct from the out-patient clinic. If the history was not suggestive of any of the recognized organic causes of dyspepsia and if clinical examination and the F.T.M failed to reveal evidence of organic dyspepsia the patient was returned to the unit with a note to the medical officer recommending any simple measures that seemed appropriate. Further investigation was rarely thought necessary, and often was undesirable, in such cases, as the soldier is notoriously highly suggestible and the idea of disease is more easily implanted than eradicated. In special circumstances a diagnosis of peptic ulcer was made in the out-patient clinic without in-patient investigation. Thus if a man had a paramedian abdominal scar with a typical history of ulcer dyspepsia and a history of perforation, gastro-enterostomy, etc., and if the F.T.M. done here showed a climbing hyperchlorhydria, there was considered to be enough evidence to justify "boarding" him as a case of peptic ulcer. Or if a man gave a typical history of ulcer along with a convincing story of having been investigated in civil life and treated by Sippy or Lenhartz type of diet, then a climbing or plateau hyperchlorhydria with consistent clinical signs—e.g., localized epigastric tenderness, pallor, and often loss of weight—was regarded as sufficient evidence of the existence of an ulcer. Marked hyperchlorhydria—i.e., a curve which after the first hour was consistently at or above 60 c.cm. N/10 HCl—was required before such a step was taken. Such cases were labelled peptic ulcer, as it was often impossible to determine the location of the ulcer accurately without another barium meal and as the aim was primarily to determine whether or not a man was fit for military duties. The in-patients were investigated by a second F.T.M., a barium meal, and often examination of faeces for occult blood; and the diagnosis was based on a careful consideration of the history, a clinical examination, and the results of special investigations. Ulcer was never diagnosed if the radiologist reported a normal stomach and duodenum. On the other hand, a marked hyperchlorhydria in the presence of active symptoms and consistent clinical findings, if there was persistent deformity and defective filling of the duodenal cap, was taken to be enough evidence of duodenal ulcer: it was thought to be wrong to base a diagnosis on "direct" vision of an ulcer crater only and on no other grounds. In some cases reflex duodenal spasm was excluded by cholecystography, pyelography, etc., if the history or clinical examination suggested such a possibility. The presence of occult blood in the faeces was sometimes helpful. Gastric ulcer was, of course, diagnosed only in the presence of "direct" radiological evidence.

During the period November, 1940, to February, 1941, 257 cases presenting symptoms of dyspepsia as a principal feature were seen at this hospital. Of these, 45 must be disregarded, as a final diagnosis was not made here, some having moved to another area before investigation could be started, some having been admitted to near-by civil or E.M.S. hospitals from our waiting list by arrangement, and a few recent ones having to await admission. The remaining 212 cases were fully dealt with and investigated by us; 88 were in-patients and 124 out-patients. These two groups are discussed separately.

In-patients

In Table I the in-patient cases are classified according to type of dyspepsia; it gives the numbers and percentage incidence of each type, the average age of onset according to the patient's history (which is not always as reliable in the Army as in civil life), and the numbers of each type originating during Army service or in civil life.

TABLE I.—*In-patients*

Diagnosis	No.	Percentage	Average Age of Onset	Onset in Civil Life	Onset in Army
			yrs.		
Duodenal ulcer	30	34·1	28·0	25	5
Gastric ulcer	10	11·4	29·3	6	4
Functional dyspepsia	25	28·4	27·2	9	16
Acute gastritis	4	4·6	39·0	0	4
Chronic gastritis	2	2·3	33·5	2	0
Psychoneurosis	5	5·7	18·4	5	0
Hyperchlorhydria	2	2·3	19·0	2	0
Achlorhydria	1	1·1	39·0	0	1
Dyspepsia (aetiology obscure)	2	2·3	40·0	1	1
Constipation	2	2·3	30·5	0	2
Carcinoma of stomach	1	1·1	50·0	0	1
Appendicular dyspepsia	1	1·1	27·0	1	0
Chronic cholecystitis	1	1·1	34·0	0	1
Pulmonary tuberculosis	1	1·1	42·0	0	1
Banti's syndrome	1	1·1	19·0	0	1
Total	88	100		51	37

45.5% of the 88 cases were proved to be ulcers, the incidence of gastric ulcer being remarkably high, although 5 of these were at the pylorus and were judged by the radiologist to be gastric and not duodenal. 28.4% were labelled functional dyspepsia. This group was composed of men complaining of active indigestion, nearly always of a type similar to that found in ulcer cases; but in the majority the history was atypical in some direction, and investigation by the F.T.M., barium meal, and occult blood test, and often cholecystography, chest radiography, urine culture, etc., was negative, although transient hyperchlorhydria or mild hypochlorhydria was found in some or there was radiological evidence of hypermotility or atony. In no instance was this diagnosis made if any well-defined sustained abnormality was reported. A point of clinical interest is that in the functional dyspepsia group abdominal tenderness was rare, whereas in the ulcer group well-defined localized epigastric tenderness was usually present. In the 4 cases of acute gastritis there was vomiting with or without diarrhoea; some were febrile, others dietary in origin. The 2 cases of chronic gastritis had hypochlorhydria, with excess mucus in all specimens, and a compatible history; the barium meal served to exclude other causes. Of the 5 labelled psychoneurosis 3 were cases of hysterical vomiting, 1 was globus hystericus, and 1 was aerophagy that was manifestly hysterical; investigation by barium meal was negative in every case. In all 5 cases the hysterical symptoms had been present several years before enlistment. Of the 2 cases of hyperchlorhydria 1 had a very high climbing curve and an atypical history, and two barium meals failed to reveal any ulcer of stomach or duodenum. This patient responded well to treatment with alkali and light diet, and returned to duty. The other also showed a climbing curve, but with a history typical of duodenal ulcer, although the barium examination failed to reveal any abnormality: as there was a fifteen-year history and the symptoms did not improve on alkali and simple dietary measures, and as he was physically under-developed, he was "boarded" out of the Army. The case of achlorhydria, confirmed by histamine, occurred in a thin middle-aged man who complained of anorexia and loss of weight, and in whom all other investigations were negative. He returned to duty, having gained weight after treatment with acid. hydrochlor. dil. and graded diet. Two cases were labelled dyspepsia of unknown type. One of these was that of a man aged 55 who had an eight-year history of recurrent attacks of

vomiting, each lasting two to three weeks: he was admitted during an attack. Clinical and barium examinations were negative, and the F.T.M. showed only mild hyperchlorhydria and no mucus. Renal and chest investigations were also negative. As he was of low mentality and had pronounced arteriosclerosis he was " boarded " out of the Army. The other case of dyspepsia of unknown type was that of a man aged 33, with epigastric pain after meals not relieved by alkali or food, in whom a barium meal showed exaggerated gastric mucous folds and spastic duodenal cap without obvious cause. As he was unable to swallow a Ryle tube and gastroscopy could not be performed the diagnosis remained uncertain (? chronic hypertrophic gastritis). Simple treatment allowed of his return to duty. Among the remaining cases the patient with appendicular dyspepsia had a recurrent subacute appendicitis, and the case of pulmonary tuberculosis occurred in a prematurely old man aged 43 whose only symptoms were gastric in origin and in whom fibroid tuberculosis was detected only after gastric tests were negative. In this series of 88 cases there were 3 of haematemesis and melaena—2 due to duodenal ulcer, which recovered, and 1 in which death occurred after repeated severe haematemeses and in which necropsy showed advanced changes of Banti's syndrome. Only 1 of the 88 patients was admitted with perforated (pyloric) ulcer.

Out-patients

In Table II the out-patient cases are classified in a similar manner. Of the 124 cases 35.5% were diagnosed as peptic ulcer on the basis already outlined. As might be expected

TABLE II.—*Out-patients*

Diagnosis	No.	Percentage	Average Age of Onset	Onset in Civil Life	Onset in Army
			yrs.		
Peptic ulcer	44	35·5	26·9	36	8
Functional dyspepsia ..	54	43·6	25·0	26	28
Acute gastritis	2	1·6	27·0	0	2
Chronic gastritis	4	3·2	38·0	2	2
Psychoneurosis	6	4·8	20·3	4	2
Hyperchlorhydria	2	1·6	25·0	2	0
Achlorhydria	3	2·4	31·0	2	1
Appendicular dyspepsia ..	4	3·2	29·5	0	4
Chronic cholecystitis ..	1	0·9	37·0	1	0
Malingering	4	3·2	29·0	0	4
Total	124	100		73	51

the functional dyspepsia group (43.6%) is greater than in the in-patient series ; these cases gave an atypical history, although often there were points of similarity with ulcer dyspepsia cases, in which the patient looked fit and in which epigastric tenderness was absent. In no instance did the F.T.M. show any sustained departure from normal, although mild degrees of transient hyperchlorhydria and hypochlorhydria, as well as a suggestion of hypertonia or hypotonia, were not uncommon.

Six cases are included under the heading psychoneurosis: 2 were cases of neurotic aerophagy (1 of long duration, 1 dating from enlistment); 1 was a case of hysterical dysphagia with other hysterical stigmata; 1 was that of a man, with visceroptosis as shown by barium series, who had already been discharged from the Army in peacetime for this complaint and was markedly neurotic; the remaining 2 were cases of anxiety neurosis following bombing and melancholia, in neither of which were dyspeptic symptoms outstanding, but which were referred on this account.

The cases of hyperchlorhydria showed fairly high curves ; 1 had a quite atypical history, and the other had had a barium test meal in another military hospital just previously. The 3 cases of achlorhydria were in comparatively young men who had normal blood counts and minor symptoms. Of the remaining patients 4 were regarded as malingering: 2 of these were under escort, 1 had already been investigated in another military hospital, and, like the fourth man, in whom investigation was not regarded as necessary, the bizarre history was impossible of belief. In all cases the men's attitude was obviously that of trying to " put one over " on the M.O. These men were warned of the possible consequences of untrue complaints. While I cannot agree with the view held by some that malingering does not occur in the modern Army, it is in my experience extremely uncommon.

Discussion

This analysis will not elicit any facts in the aetiology of peptic ulcer. However, several interesting points emerge therefrom. First, the incidence of ulcer in this series is probably very similar to that found in civil hospital practice. This finding is not incompatible with the figures of Payne and Newman (1940), for reasons already mentioned. My experience with the B.E.F. was that a much higher incidence of ulcer was found than in the present series, although in the evacuation from France the actual figures were lost. It will be seen from the tables that 67 ulcers began in civil life, against 17 during Army service. Of the latter, 3 were in Regular soldiers and 4 in Regular officers of many years' service ; therefore only 10 out of the 84 cases of ulcer arose in the Army during this war. The majority of ulcer cases in this series occurred in reservists during their period in civil life and in volunteers and conscripts from 27 years upwards. These figures do show that the problem of peptic ulcer incidence in the Army does not differ from that in civil life, and it is probable that the increased incidence of ulcer among civilians since the last war is the major factor in the prominence of such cases in this war in comparison with the Army of 1914-18. Increased awareness of its existence is probably also a factor in a medical service which, so far, has been less busy with battle casualties than in the previous war, so that more time can be given to cases of dyspepsia. The disposal of the man with peptic ulcer has been by medical board and discharge from the Army, as it is clear that this kind of man does not do well in the Army. The only exceptions to this rule have been those highly trained Regular officers who were given a full course of medical treatment: the officer can usually regulate his diet in a way that the rank and file cannot, and the officers in this series so treated have returned to duty symptom-free.

The incidence of 79 cases of functional dyspepsia in 212 cases is probably higher than that met with in civil life, and it will be seen that 44 of these had their origin during Army service, as against 35 arising in civil life, a finding that is not unexpected. I have no doubt that in each of these cases the man was suffering from genuine dyspepsia due to some, often minor, disturbance of function: the word " functional " is used advisedly to indicate this, and not loosely to include all cases in which organic disease could not be found. The aetiological basis of this type of case is not easy to define, although it is probably no more obscure than the aetiology of peptic ulceration. As already mentioned, evidence of some functional disturbance was frequently present, such as minor degrees of hyperchlorhydria, hypochlorhydria, hypermotility, gastroptosis, or atony, although sometimes it was not of a degree consistent with the severity of the symptoms. In a number of cases dental sepsis was present. It is obvious that the causes of this type of dyspepsia lie deeper than in the factors which have already been mentioned and which were often absent. In some cases the sudden change from civil diet to Army diet and from a sedentary life to vigorous training undoubtedly served at least to aggravate any tendency to gastric upset. In my opinion a potent factor in those

cases was worry and anxiety, often arising from circumstances—domestic, financial, etc.—already present in civil life and carried with the man into the Army. In other cases the source of worry was associated with the war, although not with Army routine. It is not always realized that the soldier in this war has the same sources of worry as are so universal among the civilian population; thus very many men are anxious about their wives and parents in bombed areas, or about their families evacuated to unfamiliar surroundings. Then there are men who have left good civilian positions for much less remunerative Army service, not all having their pay made up; others have had their training for a skilled but non-essential occupation interrupted and are apprehensive of the future. Army life itself gives few causes of worry, as the soldier is well looked after; but undoubtedly some men worry about the uncertainty of when their next move will be made and where it may take them. It seems reasonable to suggest that anxiety may play a part in the production of dyspepsia in men whose autonomic nervous system is constitutionally somewhat precariously balanced, especially as it is agreed that worry has an adverse influence on the symptoms of established peptic ulcer. In pointing out the factor of anxiety it is not suggested that those men suffered from anxiety neurosis: quite the contrary, as with them, unlike cases of anxiety neurosis, there was adequate cause for worry. Nor was the anxiety of pathological intensity or such as to interfere with their general efficiency: such men were never medically "boarded," and simple measures were sufficient to fit them for duty. They were firmly assured that they did not suffer from any organic disease and that their health was good and would improve under Army conditions. In only a few cases were medicines—e.g., acid. hydrochlor. dil. or magn. trisilicat.—necessary. Details of the findings were always sent to the unit M.O.

The incidence of actual neurosis was very low; 9 of the 11 cases arose in civil life and were unchanged by Army service, save possibly for the better. The incidence of chronic cholecystitis and gastric carcinoma is much lower than in a civil hospital, probably owing to the lower average age of our patients.

Conclusion

This analysis shows that the problem of dyspepsia in the Army is more or less the same as that of peacetime civil life, any differences being determined by such factors as age groups, sex, general anxiety about the war, etc. Army conditions have not produced any new syndrome, and it is very probable that they have not increased the incidence of gastric or duodenal ulcer. The increased incidence of dyspepsia in the Army of this war finds its parallel in a comparable increase in the civil population since the last war, and is directly related thereto.

Summary

257 cases presenting symptoms of dyspepsia were seen at a military hospital during a period of four months. Of these, 212 are considered in detail.

The incidence of peptic ulcer was similar to that found in civil hospitals.

There is an increased incidence of functional dyspepsia, the aetiology of which is discussed.

The analysis does not reveal that Army conditions have any marked effect on the production of dyspepsia.

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GASTRO-PAPILLOMATOSIS DUE TO VITAMIN A DEFICIENCY INDUCED BY HEATED FATS*

BY

STEPHAN BECK, M.D.†

AND

P. R. PEACOCK, M.B., B.S., M.R.C.S.

(From the Research Department of the Glasgow Royal Cancer Hospital)

Since Fibiger (1913) first described experimentally induced tumours of the fore-stomach of the rat many other workers have investigated this problem without, however, reaching a satisfactory explanation of his original results. Fibiger described three types of lesions: (*a*) multiple papillomata of the fore-stomach; (*b*) squamous carcinoma of the fore-stomach; and (*c*) carcinoma of the tongue. He also obtained a carcinoma in a mouse that was transplantable. These lesions he attributed to the presence of a nematode, *Gongylonema neoplasticum*, derived from cockroaches which were present in the animal-house and which were consumed by the rats in addition to their diet of white bread and water. Passey (1934) drew attention to the fact that such diet must have been deficient in vitamins, and that vitamin A deficiency in the absence of the gongylonema can lead to papillomatosis of the fore-stomach of the rat. Cramer (1937) reviewed experimental work, including his own investigations bearing on Fibiger's results, and concluded that "diet and parasite are in themselves not sufficient to account for the lesions observed by Fibiger, and that there must be yet another factor involved which has not yet been identified." More recently Roffo (1938, 1939) claimed to have obtained a wide range of pathological lesions, including ulcers, papilloma, and carcinoma of the fore-stomach, adenocarcinoma of the glandular stomach, and sarcoma of the stomach and liver, in rats fed with heated or ultra-violet-irradiated cholesterol, and with overheated animal and vegetable fats. It is clear from the copious illustrations to his papers that Roffo has induced marked hyperplasia of the epithelium of both parts of the rat's stomach, amounting in some cases to histological evidence of malignancy, though the carcinomata do not seem to have metastasized to the liver, as might have been expected. The sarcomata, however, metastasized freely. These experiments are therefore of outstanding interest and demand independent investigation. Roffo believes that carcinogenic hydrocarbons are formed from sterols by the action of heat or ultra-violet rays, but, according to Cook and Kennaway (1940), his views on the nature of the chemical changes involved are inadequately supported by his experimental evidence. The presence of carcinogenic hydrocarbons in the food has been shown by Waterman (1939) to be capable of inducing tumours in the fore-stomach of mice.

In this laboratory an examination of a variety of fats has been made, after different conditions of heating, for the possible presence of known carcinogenic hydrocarbons, but nothing having the characteristic fluorescent spectrum of these substances has yet been demonstrated. It seems possible, therefore, that other types of carcinogen may be partly responsible for Roffo's experimental results. The suggestion that ordinary cooking fats may develop carcinogenic properties under the action of heat raises a practical problem which might have a bearing on the incidence of gastric cancer in man. The fats used in Roffo's experiments were apparently heated to 300-400° C., a higher

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range of temperature than is ordinarily reached in domestic cooking, but it seemed possible that similar changes might occur progressively in fats repeatedly heated at lower temperatures. Even in times of peace economic conditions habitually forced a large part of the community to use fats repeatedly for cooking, and our experiments were therefore designed to imitate the worst conditions of frying likely to be in daily use, and to test the fats so treated by feeding them to rats and mice.

Experimental

1. A mixed cooking fat (equal parts of cotton-seed oil and whale oil) was heated to 200-220° C. in a closed iron saucepan for twenty to thirty minutes on thirty consecutive weekdays. The total time of heating amounted to about twelve hours. White bread was fried each day in this fat, allowed to cool, and then fed to 50 Norwegian hooded rats, maintained on a basal diet of whole oats, green vegetables, and water, with the addition of about 2 c.cm. of milk per rat three times a week and 2 grammes of carrot once a week after the first two months. When this experiment had been in progress for twelve months 40 rats had died, of which 8 showed multiple papillomata—6 with central ulceration—1 had a single unulcerated papilloma, and 2 showed irregular hyperplasia of the epithelium, all the lesions occurring in the fore-stomach. One rat developed a carcinoma of the lower lip. As in the foregoing experiment the bread was heated as well as the fat, this variable factor was eliminated in subsequent work by heating the fats alone and, after cooling, spreading them on white bread for feeding to the animals, using unheated fat spread in similar amounts as a control. The survivors of this first group of rats were fed in this manner for a further period of seventeen months, with the addition of about 2 grammes of carrot per rat four times a week, for reasons given below.

2. Twenty-four inbred Wistar albino rats were fed on the basal diet, with the addition of pure lard heated on thirty consecutive weekdays to 200-220° C. for twenty to thirty minutes.

3. Twenty-four Wistar rats were fed on the same basal diet, with the addition of cotton-seed oil, heated in the same way.

4. Twelve Wistar rats were fed on the basal diet, with the addition of unheated lard.

5. Twelve Wistar rats were fed on the basal diet, with the addition of unheated cotton-seed oil. (In Groups 2 to 5, after two months, 2 grammes of carrot once a week, and after a further five months four times a week, was added to the diet.)

6. Fifty stock mice were fed on the basal diet, with the addition of repeatedly heated mixed cooking fat spread on white bread, as described in the second paragraph under Group 1. (After two months 0.5 gramme of carrot once a week, and after a further ten months six times a week, was added to the diet.)

Litters of rats were divided between Groups 2 to 5 so that the groups were genetically comparable. During the first year of these experiments symptoms suggestive of avitaminosis-A were observed in young rats, particularly in Groups 2 and 3. The difference between these groups and the controls became more marked as time passed. The animals were smaller and less robust than the controls, had dry fur and slight xerophthalmia, and avoided exercise except in pursuit of food. As the control animals showed no such symptoms it seemed that the addition of heated fat had in some way neutralized or interfered with the metabolism of the dietary vitamin A. This possibility was tested in the following manner:

7. Twenty-four Norwegian hooded rats were fed on the basal diet, with the addition of about 3 c.cm. of milk and about 2 grammes of carrot once a week. This diet cannot be considered deficient in vitamin A. After four days the following additions to the diet were made: (*a*) 6 rats received 0.5 gramme of unheated lard six days a week; (*b*) 6 rats received 0.5 gramme of lard heated at 327° C. for one hour six days a week; (*c*) 6 rats were similarly fed with lard heated at 220° C. for twelve hours; and (*d*) 6 rats were similarly fed with lard heated at 220° C. for one hour. After two months 2 rats from each group were killed and their livers rapidly removed, rinsed in physiological saline, minced, and desiccated. One gramme of desiccated liver was shaken with 5 c.cm. of chloroform for five minutes, the extract was then decanted, and dilutions of 1/1, 1/2, 1/4, up to 1/128, with chloroform, were made in a series of test-tubes. To each tube, containing 0.5 c.cm. of extract, 2 c.cm. of 30% solution of antimony trichloride in chloroform was added, and the highest dilution in which the blue vitamin A colour reaction could be detected was noted. The results of these estimations are shown in Table I.

TABLE I.—*Relative Vitamin A Contents of Rat Livers*

Rat No.	Lard	Vitamin A Content of Liver (Control = 1)
375B	Unheated (control)	1
376B		1
372B	Heated, 220° C. 1 hr.	1
373B		1
363B	Heated, 220° C. 12 hrs.	1/2
366B		1/2
361B	Heated, 327° C. 1 hr.	1/4
362B		1/8

It will be seen that the vitamin A content of the liver was reduced in proportion to the degree and duration of heating to which the lard was subjected. The remaining rats in this experiment were then fed for one month on a diet rich in vitamin A (basal diet, plus 2 grammes of carrot daily); one from each group was sacrificed, and the liver vitamin A estimated in the above manner. No differences were found between them, showing that the interference with vitamin A metabolism due to the heated lard was not permanent. The remainder of the animals are still under observation.

When animals died their stomachs were washed out and then filled with 10% formol-saline and left to fix for twenty-four hours before being opened. Fixation in this way gave very satisfactory preparations, free from distortion. All the stomachs were subjected to independent histological examination by Dr. L. Woodhouse Price, who reported his findings without knowing the details of the experiment. This is the routine procedure with all histological material in this laboratory. All but three lesions classed as papilloma were histologically confirmed. The results are shown in Tables II to V.

TABLE II.—*Lesions in* 14 *out of* 44 *Norwegian Hooded Rats, surviving for More than* 4 *Months, fed on Basal Diet and repeatedly Heated Mixed Cooking Fats* (30 *Died without Gastric Lesions*)

Rat No.	Duration of Experiment at Death	Lesions
108B	139 days	9 papillomata (5 ulcerated) in fore-stomach
138B	182 ,,	15 ,, (ulcerated) ,,
112B	221 ,,	4 ,, ,, ,,
113B	225 ,,	4 ,, ,, ,,
122B	226 ,,	1 papilloma ,, ,,
141B	236 ,,	1 ,, ,,
127B	268 ,,	21 small papillomata ,,
103B	275 ,,	1 ulcerated papilloma ,,
144B	301 ,,	Marked hyperplasia of fore-stomach
148B	312 ,,	Hyperplasia of fore-stomach
149B	318 ,,	Haemorrhage in fore-stomach
150B	343 ,,	Keratinizing carcinoma of lower lip
128B	354 ,,	2 haemorrhagic ulcers in glandular stomach
105B	436* ,,	Haemorrhage in glandular stomach

* On vitamin-A-rich diet after first year.

TABLE III.—*Gastric Lesions in* 6 *out of* 19 *Wistar Rats, surviving for More than* 4 *Months, fed on Basal Diet plus repeatedly Heated Lard* (13 *Died without Lesions*)

Rat No.	Duration of Experiment at Death	Lesions
741	139 days	2 ulcerated papillomata of fore-stomach
873	192 ,,	3 ,, ,, ,,
877	209 ,,	2 papillomata (1 ulcerated) ,,
694	304 ,,	4 ulcerated papillomata ,,
713	304 ,,	3 ,, ,, ,,
714	315 ,,	1 papilloma ,,

TABLE IV.—*Gastric Lesions in* 3 *out of* 14 *Wistar Rats, surviving for More than* 4 *Months, fed on Basal Diet plus repeatedly Heated Cotton-seed Oil* (11 *Died without Lesions*)

Rat No.	Duration of Experiment at Death	Lesions
878	117 days	1 ulcerated papilloma of fore-stomach
969	196 ,,	1 ,, ,, ,,
1715	318 ,,	1 ,, ,, ,,

TABLE V.—*Gastric Lesions in* 3 *out of* 45 *Stock Mice surviving for more than* 4 *Months, fed on Basal Diet plus repeatedly Heated Cooking Fat* (41 *Died without Lesions; 1 Survives*)

Mouse No.	Duration of Experiment at Death	Lesions
1104	271 days	1 papilloma of fore-stomach
1106	279 ,,	1 ,, ,,
1134	385 ,,	Diffuse hyperkeratosis of fore-stomach

In the three groups of rats receiving repeatedly heated fats in addition to the original basal diet 77 survived for more than four months, and 17 of these died within the first year of the experiment and had papillomata in the fore-stomach. Control rats (receiving unheated fats) dying within the same period showed no papillomata, but 2 had minor degrees of hyperplasia. Among 25 old rats (over 2 years) from other experiments 3 showed hyperkeratosis of the fore-stomach, 1 diffuse hyperplasia, and 1 a simple papilloma of the fore-stomach. In our experience similar lesions have not been observed in control rats under 2 years old.

The benzidine test was carried out on stomach contents in cases showing brownish discoloration of the glandular stomach, and was found to be positive, confirming the presence of blood in the stomach cavity, probably derived from small ulcers. Papillomata, ulceration, and consequent haemorrhage appear to be definitely related to the feeding of repeatedly heated fat and associated with symptoms of varying degrees of avitaminosis-A. To test the possible interrelation between these pathological states 10 rats that had been under experiments for a year and 31 for seven months were given a diet rich in vitamin A, consisting of rat-cake nuts (see accompanying formula) daily, carrot 2 grammes four times a week, and about 2 c.cm. of milk once a week, while continuing to receive the differently treated fats as before. Six of these rats died after being on the vitamin-A-rich diet for more than a year, and none of these showed any gross lesion of the stomach. Two survivors are still under observation. The others are accounted for in the tables.

Rat-cake Formula (*Supplied by the North-Eastern Agricultural Co-operative Society, Ltd., Bannermill Place, Aberdeen*)

Wheat offal (fine middlings No. 2)	19·2%
Ground wheat	19·2%
Sussex ground oats	19·2%
Ground barley	9·5%
Ground maize	9·5%
Meat and bone meal (45% protein)	9·5%
Dried skim-milk	7·0%
White fish meal (60% protein)	4·7%
Dried yeast (40% protein)	1·2%
Sodium chloride	0·5%
Cod-liver oil	0·5%

In more recent experiments 92 rats have been maintained for ten months on the vitamin-A-rich diet throughout, with the addition of heated lard (350° C. for one hour or 220° for about twelve hours). No pathological lesions of the stomach have been observed among 10 that have died. *In vitro* tests for vitamin A in mixtures of cod-liver or halibut-liver oil and heated fats dissolved in chloroform were carried out to see whether any direct neutralization occurred, but the usual antimony trichloride blue reaction could not be observed, as the heated fats alone gave a brilliant red colour reaction with this substance. Attempts to separate the vitamin A from the heated fats after mixture were not successful, and it is not certain at present whether any direct destruction of vitamin A by heated fats occurs or whether the vitamin reaction is merely masked by the intensity of the red colour reaction. Further work is being done to clear up these points and to determine the nature of the substance in the heated fat responsible for the red colour reaction with antimony trichloride.

Discussion

The foregoing evidence suggests that there is present in repeatedly heated fats a factor which interferes in some way with the absorption or metabolism of vitamin A. Our results confirm Roffo's claim that heated fats cause papillomatosis in the fore-stomach of rats, but no evidence of glandular tumours or of sarcoma has been found. One rat developed a carcinoma of the lower lip, but the significance of a single case cannot be assessed.

Although no recognizable carcinogenic hydrocarbons were formed in heated fats under the conditions of our experiments, a factor which may provisionally be termed "anti-vitamin A" was produced, and the subsequent pathological lesions developed by rats and mice receiving this factor with an otherwise adequate diet were apparently due to an artificially induced avitaminosis-A. Thus our results correlate those of Cramer and of Passey with some of the results observed by Fibiger and by Roffo. The malignant tumours originally described by Fibiger and the more extensive series of Roffo may have been due to the action of some hitherto unrecognized factors in the presence of avitaminosis-A. Mice were less susceptible to induced avitaminosis-A and papillomatosis than rats.

So far as any application of these experiments to human pathology is concerned there is no evidence of the development in fats, under ordinary cooking conditions, of any known carcinogen, but the anti-vitamin-A factor may possibly be detrimental to health, particularly when the dietary intake of vitamin A is low. If there is any analogy between rats and humans in this respect the addition of vitamin A to the diet in the form of raw carrot seems to be sufficient to counteract the effects of the anti-vitamin. The habit of eating raw carrot seems to be prevalent at the present time, and it is possible that future statistics will show whether this has any influence on the incidence of human gastric diseases.

Summary

Groups of rats and mice were fed with a variety of repeatedly heated fats in addition to an adequate basal diet. Within a year signs of avitaminosis-A appeared among the rats, and cases of ulceration and papillomatosis of the fore-stomach were observed among those that died. Control animals fed with unheated fats and the same basal diet showed no gross pathological lesions. Extracts of the livers of rats fed with lard heated under various conditions in addition to the basal diet contained reduced amounts of vitamin A as compared with controls.

The heated fats did not contain recognizable amounts of any known carcinogen, but they included some substance which interferes with the antimony trichloride reaction for vitamin A, giving a bright red coloration.

Rats fed with repeatedly heated fats in addition to a diet rich in vitamin A (carrot) showed no gross pathological lesions in fore-stomach or reduction in liver vitamin A.

The mechanism of papillomatosis in these experiments seems to be related to an induced avitaminosis-A, due to the presence in repeatedly heated fats of an "anti-vitamin A" of undetermined nature.

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CARDIAC MASSAGE FOR IMPENDING DEATH UNDER ANAESTHESIA

BY

HAMILTON BAILEY, F.R.C.S.

Surgeon, Royal Northern Hospital

At every turn and in every walk of life it is becoming increasingly apparent that the only effective method of successfully meeting a sudden unexpected catastrophe is to have a preconceived plan and to be able to put it into action immediately. If that plan is comprehensive, and if it can be executed smoothly, it may succeed. To set the heart beating when, during general anaesthesia, it has suddenly and unexpectedly become still, indeed calls for a clear-cut plan of action, for it ranks even higher than the arrest of serious arterial haemorrhage as the most urgent surgical emergency. I have performed cardiac massage about 40 times. In 13 cases the heart has restarted in earnest; but too often, after giving hope for hours or days, disappointment has been the outcome: only 4 patients have survived.

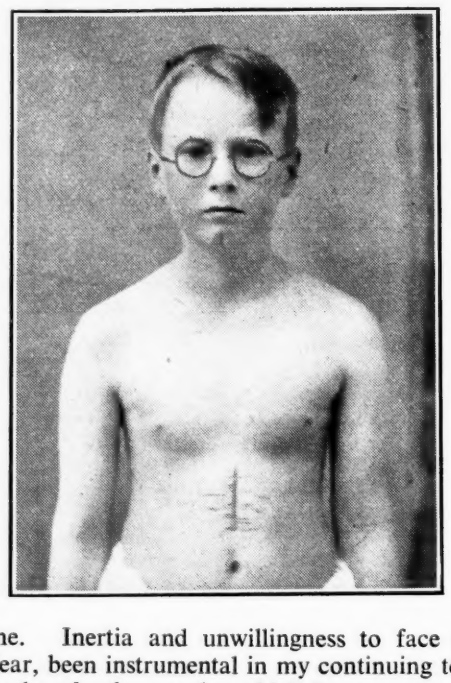
The special point I wish to raise is that cardiac massage should be resorted to earlier. An analysis of published cases shows that cardiac massage has been relatively more successful when the catastrophe necessitating it occurred during the course of an abdominal operation. It is reasonable to assume that, the abdomen being open, massage was resorted to sooner than otherwise would have been the case. In 3 of my 4 successes the operation in progress was an abdominal one, and in 2 of these massage was conducted through the original laparotomy incision. The fourth, my only non-abdominal successful case, sheds some light on the problem before us.

I had completed the operation of epididymectomy for tuberculosis on a boy aged 12. No anxiety had been experienced. I happened to look through the window of the changing-room, and saw the anaesthetist performing artificial respiration. The child had white asphyxia, and we immediately put in operation the routine of having a timekeeper call out the passing minutes. At three and a half minutes I injected adrenaline into the heart. At four and a half minutes, after hastily scrubbing up, I opened the upper abdomen through a midline incision and performed cardiac massage from below the diaphragm. A full minute elapsed without any response. There was then one beat, a short interval, then three or four beats. The heart then restarted in earnest. By the time the abdomen had been closed with through-and-through sutures some colour had returned to the patient's blanched face, the pulse was full but very rapid, and oxygen was being administered. Next day the patient said he felt well.

On the third day the boy complained of dimness and double vision. On the fourth day he could only distinguish between light and darkness. There were other evidences of serious disturbance of the central nervous system, such as incoordination and some paresis. I am not competent to discuss these neurological manifestations, nor is that the purpose of this communication. Sufficient is it to say that it was obvious that the vital centres had been left too long without a blood supply, and during the period of blindness I wondered whether it would not have been better if the cardiac massage had failed. It was during this period I became determined to advocate earlier cardiac massage. By what I believe to be an unprecedented stroke of good fortune, the patient's vision gradually returned and all other untoward signs disappeared. At the present time he has regained his sight and has quite recovered in all other respects (see photograph).

This case in particular convinced me that, to be permanently effective, cardiac massage must be instituted earlier; three and a half to four and a half minutes ("under five minutes" is the generally accepted standard) is too long to wait. Had the patient not been young I feel tolerably certain he too would have joined the large band of disappointments. Equally am I convinced that if I had made a stand against intracardiac injection taking precedence over cardiac massage before, I might have succeeded in some of the cases in which I have failed.

This is not a sudden change of front. With each succeeding disappointment I have analysed the details of resuscitation, seeking to improve them. On nearly every occasion I have deplored the time wasted in injecting



adrenaline. Inertia and unwillingness to face criticism have, I fear, been instrumental in my continuing to suggest in the works of reference for which I am responsible that cardiac massage is our last card. I wish to revise that view.

Intracardiac Injection of Adrenaline

Championed particularly by the late Harrington Sainsbury, the value of an intracardiac injection of adrenaline has received, and is receiving, pride of place in attempts to restart the heart's action. A study of the literature will show that the successes which have attended this expedient are in the main cases of cardiac arrest during chloroform anaesthesia. In my experience, not once in more than forty instances has an injection of adrenaline into the heart caused it to restart beating. In one case the prick of the needle as it traversed the chest wall (I do not think the heart muscle had been reached) apparently initiated the resumption of cardiac activity; none of the adrenaline in the syringe was injected. In spite of the fact that in every theatre in which I work I try to impress upon the staff that a "cardiac emergency outfit" should be in readiness, oftener than not several minutes have been wasted in getting together the necessary armamentarium. I suggest that the sterile syringe, a three-and-a-half-inch-long needle which fits the syringe, and a bottle of adrenaline should be kept in a sealed sterile jar on the anaesthetist's table. Here it will be in better keeping, and any benefit which adrenaline holds will still be available. But on the following point I am emphatic: adrenaline should be relegated to a subsidiary role.

Is the Heart Beating?

Those without practical experience of these catastrophes are inclined to pass this question by almost with contempt. On the contrary, so difficult and time-consuming is this all-important question that in white asphyxia the correct procedure is to assume the worst and to proceed with resuscitative measures according to a plan by which confirmation

of the necessity for heroic measures is provided by the most direct means available. I have seen an already over-occupied anaesthetist burdened with this question when all the surgeon had to do was to remove a few abdominal packs and put his finger on the abdominal aorta. It should be obvious that if the operation in progress permits access to a large artery it is the surgeon who should inform the anaesthetist. In the absence of direct access to a large artery but with an operative wound before him, the surgeon can at least state whether there is any bleeding, and in certain instances he may feel justified in cutting a moderate-sized artery in order to obtain the necessary information.

When the integument is intact it is the anaesthetist who must settle this point by the means he thinks best. In my view the carotid pulse is the best indicator. The majority consider that a stethoscope applied to the praecordium is the method of choice. My reasons for devaluing the latter are: (1) the patient's head must be left unattended; (2) artificial respiration must be stopped; (3) on at least three occasions the anaesthetist has left his stethoscope in the anaesthetic room, and twice the courier sent for it has returned empty-handed; (4) with the spectre of the coroner before him and the knowledge that by applying the stethoscope he is preventing the continuation of artificial respiration, I submit that even a cardiologist might be unable to answer this all-important question with assurance.

Distribution and Duties of Personnel

With but three to three and a half minutes at our disposal each must know his or her duty; providing they know exactly what to do, even semi-skilled and unskilled members of the theatre team can perform most useful parts.

Timekeeper.—In 1927 I suggested that a junior nurse, a student, or a porter should be detailed to cry loudly each passing minute from the time the anaesthetist sounds the warning note of danger. This plan has proved invaluable, for anxiety masks a correct estimation time.

Provider of Hot Packs.—If in addition to a timekeeper there is a junior nurse available, her duty should be to get a bowl of really hot water and some packs, and be prepared to place the packs, wrung out in hot water, on the praecordium at frequent intervals while the artificial respiration is in progress. This worker is not essential. She should go about her duties without asking questions or distracting the attention of the theatre sister. Her services should be at the disposal of the surgeon's assistant if he should require them.

The surgeon's assistant is dismissed immediately by the surgeon, and relegated to the sole task of performing artificial respiration under the direction of the anaesthetist. He carries out Sylvester's procedure—if necessary, single-handed—but sends for the most suitable helper available.

The theatre sister comes forward and takes on the duties of the surgeon's assistant. Her essential objective is to have in readiness the simplest requirements for a mid-line upper laparotomy.

The anaesthetist takes sole charge of the respiratory apparatus. His first and at all times his most important duty is to be perfectly satisfied that there is a clear airway. His other essential parts can be played without moving from his position at the patient's head.

A (Revised) Plan of Action

Artificial respiration must be started at once, and continued throughout the endeavour. Intrathecal insufflation of oxygen and CO_2 is the ideal form of artificial respiration. Sylvester's method is efficient if the airway is kept clear.

FIRST MINUTE

Anaesthetist.—Clears airway; tilts the table, even slightly, so as to lower the head; breaks a capsule of amyl nitrite under the patient's nostrils.*

Surgeon.—Appoints a timekeeper; dismisses his assistant; with the help of the theatre sister, attends to his operation so that it can be abandoned temporarily; if possible, directly palpates a large artery.

SECOND MINUTE

Anaesthetist.—Administers oxygen; passes an intratracheal tube if circumstances permit and he is particularly skilled in this manœuvre.

Surgeon.—Supervises sterilization of the skin of the upper abdomen and lower thorax while he scrubs up or changes his gloves, as necessary.

Theatre Sister.—Prepares the skin of the upper abdomen and lower thorax.

THIRD MINUTE

Anaesthetist.—If asked to do so, palpates the carotid artery; when free from duties of the second minute opens the cardiac emergency jar and places it within reach of the theatre sister.

Surgeon.—If the information received is that the heart is not beating, makes an incision in the midline through the linea alba, large enough to insert the hand; starts cardiac massage from below the diaphragm, at first with a quick forcible movement for half a minute—the base of the left hand over the lower thorax aids in the manœuvre; if there is no response after thirty seconds, changes the movement to a slower rate of about eighty per minute.

Theatre Sister.—Fills the syringe with 1 c.cm. of adrenaline and fixes the needle firmly to the barrel.

FOURTH MINUTE

Surgeon.—Removes his left hand from the thoracic wall while the adrenaline is injected into the heart by the anaesthetist; immediately afterwards, with renewed hope, continues massage as in the first instance—i.e., quickly.

FOUR-AND-A-HALF MINUTES

Surgeon.—Detaches diaphragm from left costal margin with a stroke of the scalpel; opening stretched to take hand; rhythmically squeezes the heart within the pericardium (this seldom fails to give at least a temporary response).

If the last manœuvre is successful the opening in the diaphragm must be closed with catgut stitches. It is quite sufficient to close the upper midline incision with strong interrupted through-and-through sutures traversing all layers.

Conclusion

I have avoided detailed reference to the literature, not from any wish to minimize the contributions of others, but to simplify the message I would convey. Since Darling and Lane published the first successful case in 1902, I was surprised to find that only 50 permanently successful cases had been reported. In several of these both adrenaline and cardiac massage had been used. It would appear that the combination is useful. One case in particular supports this hypothesis; for after two minutes of massage with no response, adrenaline followed by more massage resulted in recovery (Fiddian, 1936).

"Massage—adrenaline—more massage—supradiaphragmatic massage" is, I believe, the watchword which will save more patients. Massage—earlier massage—is the life-giver; adrenaline is its handmaiden.

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* This valuable suggestion was made by Primrose (1935); the object of administering this drug is to distinguish between cardiac depression and cardiac arrest.

"BLUE DRUM," OR IDIOPATHIC HAEMOTYMPANUM, IN CHILDREN

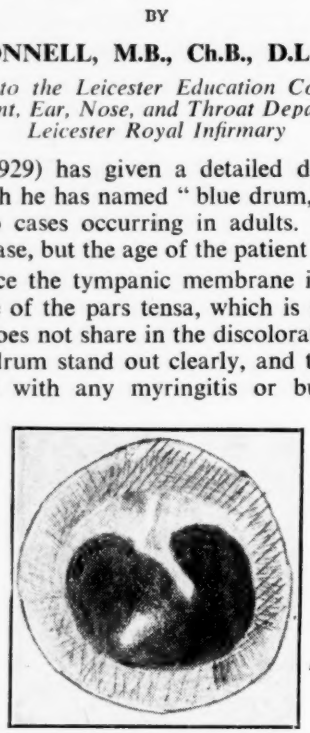
BY

J. H. O'DONNELL, M.B., Ch.B., D.L.O., F.R.C.S.

Aural Surgeon to the Leicester Education Committee; Chief Assistant, Ear, Nose, and Throat Department, Leicester Royal Infirmary

Shambaugh (1929) has given a detailed description of a condition which he has named "blue drum," and of which he reports two cases occurring in adults. Fowler (1939) also quotes a case, but the age of the patient is not specified.

In appearance the tympanic membrane is blackish blue over the whole of the pars tensa, which is retracted. The pars flaccida does not share in the discoloration. The landmarks of the drum stand out clearly, and the condition is not associated with any myringitis or bulla formation.



"Blue drum"

Deafness of the conductive type is present. Two instances of "blue drum" have been encountered recently in children, and a summary of the histories may be of some interest.

Two Case Records

Case 1.—This patient, a girl aged 7, had a history of intermittent deafness associated with colds, occasional earache, but no otorrhoea. During the fortnight preceding examination the deafness had become much worse, although there were no local or general signs of an inflammatory condition. Slight tinnitus was complained of. Examination of the right ear showed that the tympanic membrane had an intense blackish-blue appearance, as described above. The landmarks were readily visible, and there was no bulging. Rinne's test was negative for the C to c^1 forks, and Weber's test showed lateralization to the right. Inflation by catheter revealed some Eustachian tube obstruction, and rales were heard through the auscultation tube. The drum assumed its normal position after inflation, and the colour changed to a dull grey, with brownish patches. (Shambaugh's cases showed no change in colour after politzerization.) The hearing for the whisper improved from 6 inches to 10 feet, normal audibility being 20 feet. The left ear had a retracted membrane, with a little fluid exudate of a clear character in the lower part of the tympanum. There was a conductive deafness of a less degree than that of the right ear, the whisper being heard at 2 feet before inflation and 12 feet after. The tonsils showed some evidence of infection, and there was a moderate adenoid pad.

After an interval of a few days the right drum was in its initial state of "black-blueness," although the hearing had become a little better (whisper, 2 feet). Subsequent inflations by Politzer's method over a period of some weeks resulted in an improvement of the hearing to 10 feet for the whisper, at which standard the hearing acuity remained stationary. The drum always reverted to its previous blue appearance in the intervals. This is in line with Shambaugh's experience of recurrence, although in his cases inflation was preceded by myringotomy.

Removal of the tonsils and adenoids was then carried out, and fourteen days afterwards both drums were normal in appearance and the whisper was audible at 20 feet in each ear. The condition has not recurred in the several months which have elapsed since the operation.

Case 2.—A boy aged 10 was referred for the removal of tonsils and adenoids. Some slight deafness had been noticed at home. Examination of the right ear showed a typical blue drum, with a fairly high degree of conductive deafness (whisper, 2 feet). The left drum was a little dull and retracted, and the hearing for the whisper was 10 feet. Fourteen days after the removal of the tonsils and adenoids the blueness was found to be confined to the anterior half of the drum and the whisper was audible in the affected ear at 16 feet. One month after the operation the drum was normal, as was the hearing to voice and tuning-fork tests.

Commentary

Shambaugh's cases occurred in individuals over 50 years old. The treatment consisted of myringotomy, followed by inflation, which expelled a chocolate-coloured fluid. The period of relief was only temporary, and recurrence followed. Fowler's case had an effusion into the maxillary antrum on the side of the ear lesion, but the subsequent course of the case is not mentioned.

It would appear that the condition is the result of a "hyperaemia ex vacuo," consequent on Eustachian tube obstruction. The reported cases recovered readily and completely after the removal of the primary cause of the Eustachian block.

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Medical Memoranda

Lung Collapse after Eye Operation under Local Anaesthesia

It is thought worth while recording this case, as a search of the literature failed to reveal a similar one. It is well known that collapse of the lung, both massive and partial, follows all types of surgery, occurring in about 0.3% of all operations, and that various reasons have been assigned for this. It seems certain, however, that it is not entirely due to the irritant effect of inhalation anaesthesia, causing a mucous secretion which, by becoming inspissated, finally blocks a bronchus. There are still many cases of this complication following operations with regional block local anaesthesia, although they are only about one-tenth as frequent. This compares favourably with spinal anaesthesia, in which, as regards abdominal cases at least, collapse is as common as with inhalation. In the following case the only explanation as to causation that can be suggested is that patients with glaucoma are nursed upright after operation and instructed at all costs to avoid coughing. This would tend to allow any mucus to gravitate towards the lower lobes and to accumulate there.

CASE REPORT

A spinster aged 65 was trephined by Mr. Tait of Windsor for a chronic glaucoma on December 23, the anaesthetic being a simple instillation of a few drops of 1% pantocain into the right eye. The local and general condition made satisfactory progress until January 1, when there was a sudden onset of dyspnoea, with pain in the right lower chest. I was asked to see her, and found signs suggestive of partial collapse of the right middle and lower lobes. Although there were no constitutional disturbances suggestive of lobar pneumonia she was given a short course of sulphapyridine, 7 grammes in all. Within a further twenty-four hours there was a complete collapse of the two lobes, as shown by the absence of the respiratory murmur, and a temperature of 100.2°. Postural drainage and bronchoscopy were both contraindicated by reason of her eye condition, so inhalation of carbon dioxide was tried, and although after one period of hyperpnoea crepitations were heard over the affected area the condition remained quite stationary.

By January 6 the patient was feeling fit enough to travel by car to spend a few days in a convalescent home. A radiograph taken on January 7 showed the typical appearance of collapse. She then rested a fortnight, with some pain at the right base for the first few days and with some dyspnoea on exertion. During this time large doses of ammonium carbonate were given

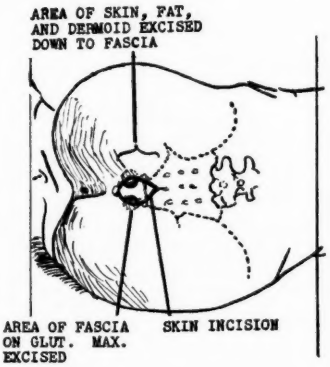
by mouth by her own doctor, and when she was seen on March 6 the condition, as judged by physical examination of the chest, had completely cleared.

Eton. ROGER LANE, M.B., M.R.C.P.

Treatment of Post-anal Dermoids

It has been found difficult to ensure healing by first intention in wounds following radical excision of post-anal dermoids. Adipose tissue in this region is particularly unsuitable for dealing with post-operative collections of blood and exudate and in maintaining a clean field for healing.

By exposing muscle in the floor of the wound it was hoped that drainage and other factors which influence healing would work to better advantage. The fascia covering the sacral and coccygeal origins of the glutei maximi is exposed by wide excision of the dermoid region, and a piece of the fascia about the size of a halfpenny is easily removed from one or both sides (see Fig.). This was done in 4 consecutive cases of excision of



infected post-anal dermoids, with closure and healing by first intention. All 4 patients were women: 2 had had exacerbations of swelling and pain within the two weeks preceding operation, and 2 had had previous incisions. All have remained healed for from six weeks to seven months after operation.

Apart from excision of the fascia the operative technique was essentially as that described by W. B. Gabriel (1937). Haemostasis was obtained by pressure and a few fine catgut ligatures. Dead space was reduced by deep silkworm-gut sutures tied over a roll of gauze. The patients were nursed on their side in bed.

Final conclusions cannot be drawn from so small a series. However, the principle of including healthy muscle in the healing process has not done any harm and may be worthy of extensive trial in suitable cases.

G. KENT HARRISON, M.D.Toronto, F.R.C.S.,
Acting Surgical Registrar, Aberdeen Royal Infirmary.

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Appendix Strangulated in Congenital Hernial Sac in an Infant

The following case may be of interest in view of the age of the patient, the nature of the contents of the hernial sac, and the fact that, though the hernia was of eight hours' duration only, operation showed that it would not have been wise, and hardly possible, to reduce it by taxis.

A baby aged 5 weeks, suffering from convulsions, was under the care of Dr. Mackay at the Queen's Hospital for Children, London, E., when he suddenly developed a swelling in the right inguinal region and scrotum. This, when examined eight hours later, was found to be a scrotal hernia. The scrotum was red, inflamed, and oedematous. The temperature was 99° F., pulse 132. The child vomited once during examination. The bowels had not moved since the appearance of the hernia. An attempt at taxis being unsuccessful, operation was undertaken.

Local anaesthetic 1% novocain was employed and the sac exposed by the usual incision. It was bluish black in colour, and when opened dark fluid poured out. The vermiform appendix, stretching from the internal abdominal ring to the scrotum, was now seen as the hernial content. It was gangrenous throughout and adherent to the sac posteriorly. The constricting agent was the internal abdominal ring. This was enlarged by dividing it in an upward and outward direction. The caecum now presented and it was seen that the constriction occurred exactly at the junction of the appendix and caecum.

The appendix was amputated, but the sac, being inflamed and adherent, was not further interfered with. Two catgut sutures were used to unite the divided internal oblique and transversalis muscles; the mouth of the sac was closed at the internal abdominal ring with a few sutures, and the internal oblique edges united with continuous catgut. The skin edges were coapted with interrupted "kalmerid" suture. The lower end of the wound was drained with a dozen strands of silk.

The baby made an uninterrupted recovery: the skin sutures were removed on the eighth day, and the wound was completely healed in ten days.

I have to thank Dr. Mackay for permission to publish this case.

London, E.2. T. O'NEILL, M.D., F.R.C.S.

Observation of Malaria Parasites in Fresh Blood Films

When fresh blood is sealed beneath a cover-slip changes occur which are not obtainable when blood is smeared directly it is shed. In some cases of malaria one of these changes is the engulfing of a malaria parasite by an amoeboid white cell. Such a process is often seen in a fresh film in which crescents abound in the blood stream. If this process be allowed partly to occur and then stained the resulting change should be demonstrable.

A fresh film was made, and after three to five minutes the cover-slip was slid away from the slide. Apart from many picturesque forms it was evident that the hoped-for result was achieved, for a "crescent," now in spheroidal form, was actually in contact with a white cell, into which had passed some of the granules of the crescent.

The crescent was stained blue with cobwebby protoplasm, the granules, 32 in number, being black. The white cell had a single lobed palette-like deep purple nucleus, its protoplasm being pink and cobwebby; in it were eight or nine granules, similar in form and colour to those in the crescent. Between the blue protoplasm of the crescent and the pink protoplasm of the leucocyte there was no demarcating border. It looked as if the white cell's meal was severely distending its outline.

When a crescent is approached by a leucocyte in the living blood it is apt, as if under sentence of death, to perform the most intense gyroscopic movements, its black granules being centrifugalized at a great pace. This revolving globe only half fills its red cell.

A similar object was obtained in the stained film after a five-minute life under the cover-slip. A ring of black rods, smaller than a red cell and corresponding to the globe mentioned above, was arranged circumferentially like a ringlet of hair. Inside it and not completely filling it was a purplish-blue cobwebby mass, while outside the ring there was a splash of blue which with its streaky short circular lines seemed to have been put into some sort of rotary movement by the gyroscopic globe it contained. It looked then as if one of these rotating bodies had been caught at a lucky moment.

C. A. VAN ROOYEN, L.R.C.P., M.R.C.S.

Undugoda, Ceylon.

P. Cohen, M. Weichsel, M. and J. H. Lapin (*J. Pediat.*, 1940, **16,** 30) record their observations on 432 whooping-cough patients treated with various therapeutic agents. Vaccine treatment, which consisted of Krueger's vaccine, Sauer's vaccine, toxin vaccine, or Bordet vaccine, did not improve the symptoms, but was even associated with attacks which were severer than those of the 80 controls. The results obtained with nasal topagen (soluble protein of *H. pertussis* in normal saline) and topagen hypodermically did not differ from those of the controls. Patients treated with convalescent serum and hyperimmune serum had fewer coughing spells, a shorter period of illness, and greater freedom from complications, but only when the serum was injected before the paroxysmal stage.

Reviews

EARLY TREATMENT OF WAR WOUNDS

The Early Treatment of War Wounds. By William Anderson, O.B.E., M.B., Ch.B., F.R.C.S. Oxford War Manuals. General Editor, the Right Hon. Lord Horder, G.C.V.O. (Pp. 96; illustrated. 5s. net.) London: Oxford University Press. 1941.

The Oxford War Primers gained no little popularity in the last war and covered a wide field of interest in medical and surgical problems. Here is the first of a corresponding series designed to bring certain subjects up to date. This volume is compact in form, well printed on good paper, and sells at a moderate price. The author frankly bases his views on practical experience gained in 1914-18, but he has not failed to consider any relevant advances in wound treatment which have been made since that date.

The first chapter deals with surgery in advanced units, and shows a clear perception of what is practicable in that zone. The advice given conforms to current practice in the British Army, and is direct and simple. The only criticism of detail which might be made is his recommendation of splints for fractures of the humerus, which depend for their action on an axillary crutch; many have found these splints to be uncomfortable and not as effective as a simple cradle application of Cramer wire in the transport period. In subsequent chapters various sections of work at the casualty clearing station or corresponding unit are considered. In discussing the use of fluids for intravenous transfusion the author does not appear to have made use of the up-to-date information on the subject to be found in the M.R.C. Memorandum on Wound Shock; nor does he recognize that an efficient blood transfusion service has been in being since the start of the war. The general principles of early wound management are admirably stated, and useful practical hints are given both in this chapter and in the remaining sections. The chapter on penetrating wounds of the abdomen is a model of compact statement and contains a wealth of sound advice. The treatment of burns is not considered in this volume, as the intention is that this subject should be dealt with in a separate manual.

This little book should be of help to every medical officer serving in the Army, as a commentary on the *Training Manual* and other standard works.

A MONOGRAPH ON SCABIES

Scabies—Civil and Military: Its Prevalence, Prevention and Treatment. By Reuben Friedman, M.D. (Pp. 276. $3.00.) New York: Froben Press. 1941.

It is a sign of the times that a monograph on scabies should now be published, and medical practitioners and the public health services have reason to thank Dr. Reuben Friedman for his timely reminder of a disorganizing disease, the effects of which have again and again been recorded, and again and again been forgotten. The book in question, entitled *Scabies—Civil and Military,* gives us many examples of the formidable consequences of scabies in the past, and up to—and beyond—the war of 1914-18, when, in one British Army, skin diseases were responsible for 90% of the sickness rate. While statistical tables are to be seen on many pages, this book is far from a dull compilation of figures. Dr. Friedman enlivens his story with many a glimpse into the past. Thus, whether it be fact or legend, it is believed that even the great Napoleon fell a victim of the prevalent scourge; and that in his campaigns, as Sokoloff relates, whole regiments, officers and men, on reaching camp would throw off their equipment and scratch en masse, their commander-in-chief scratching himself with a vengeance until blood appeared.

The reader will turn with particular attention to the sections on the prevention and the treatment of scabies. The author's views on prevention are summarized as follows: (1) personal cleanliness, (2) early diagnosis and treatment, (3) detection of and treatment for infected contacts, (4) disinfestation of the fomites. With these admirable directions every dermatologist will be in complete agreement. Dr. Friedman devotes 85 pages, divided into five chapters, to the treatment of scabies. In spite of the well-founded knowledge, long possessed by the peasantry, that external agents cured the disease, the medical writers of antiquity found the cause of scabies in a melancholy humour, in black bile mixed with irritating phlegm, and, even in Van Helmont's time, in acrid or irritating salts contained in the serum or lymph. It was against these theories that Bonomo had to contend, to establish his heretical belief that scabies was of parasitic origin and was cured only by the use of externally applied remedies (p. 194). For this purpose sulphur in some form has long been the accepted agent. Sulphur, however, has certain disadvantages which, in the reviewer's belief, are proportionally diminished as the experience of the practitioner grows. Nevertheless, we may well look to modern therapy to devise remedies which, without reducing efficiency, cut down the time factor; and, as a further step, are not greasy and are odourless. Benzyl benzoate, and more recently rotenone, a derivation of derris root, seem to satisfy these conditions. With other preparations they and their application are fully and critically discussed in the text.

This is an admirable book to which the author has clearly given much of his time and attention: an outstanding contribution to a subject which will become of more and more importance. It may even suggest to the responsible authorities in this country that something should be done to control a rapidly growing menace.

CARE OF THE MOTHER

Babies Without Tears. By Dr. Edith Summerskill, M.P. (Pp. 158. 6s.) London and Melbourne: Hutchinson and Co. (Publishers), Ltd.

This book has a noble theme to commend it. The relief of pain in childbirth and the provision of adequate facilities to prevent the terrible waste of life that still occurs are aims worthy of a crusade, but the conduct of such a crusade is neither easy nor free from danger. To write a book "for all mothers, expectant mothers, doctors and midwives" is a task that few doctors would care to undertake, and still fewer could accomplish with success. Dr. Summerskill has been unfortunate, or subtle, in her choice of title, which may refer to the eye or the perineum with equal justification, and the claim that the book presents a cogent and authoritative plea for the use of anaesthesia is open to criticism. The broad facts of the case, which few will dispute, are that unnecessary suffering can be and should be prevented, and that efficient obstetrical services would reduce the present loss of life. The urgency of the plea is for progress to be expedited.

By her handling of the subject the author has appealed more to the lay public than to the medical profession, and in doing so she has at times been unfair to both. The far-reaching effects of the cumulative influence of the Royal College of Obstetricians and Gynaecologists have not been mentioned, although it is through the activity of the college that the desired goal will almost certainly be reached. The lay reader unacquainted with the facts would believe from Dr. Summerskill's book that progress is delayed because of the callousness of man, be he doctor or politician, to the sufferings of women. This is contrary to fact and

savours of political agitation, which should have no place in even a pseudo-scientific publication. The lament that midwives are not taught to give anaesthetics and "repair any tear of torn tissues" is strange when one considers the serious implications of such a policy and realizes that it is sponsored by an advocate of safer motherhood. Readers are asked to believe that Vera Brittain's harrowing description of the confinement of Janet gives a fairly realistic picture of childbirth without an anaesthetic, and are told that every doctor knows there is nothing exaggerated in this description. This is but one example of the overstatements which weaken the value of the book, for if the author believes what she asks others to believe her experience of obstetrics cannot have been wide and must have been unfortunate. Dr. Summerskill's crusade is noble in purpose but faulty in execution.

A BOOK OF VERSE

Childhood and Other Poems. By Sir G. Frederic Still, K.C.V.O., M.D. (Pp. 152. 5s. net.) London: John Murray. 1941.

That this slender volume of verse is now available to a wider public than was the original intent of their author is a matter for congratulation, and we are glad that the counsels of those friends for whom they were first of all privately printed have prevailed. "An artless song—Tuned like some old-world melody to themes of quaint simplicity"—thus does Sir Frederic Still at once define his sense of poetry and what the reader may expect to find. And in the frank simplicity and sincerity of these little poems there is solace in these days which are harsh for the gentle of heart. More than this, the reader may if he will learn much of the writer, for in each "artless song" there is apparent the clear-sighted observer of childhood who sees with a depth of affection but who sees clearly; and a man at peace amid "books and the running brooks." Nowhere does he point a moral, but inherent in his writing are the beauty and satisfaction of truth and love and duty. The dedicatory sentence, "As one that gleaneth after the grape gatherers," is of a characteristic modesty, since it is clear that Sir Frederic venerated the masters who have caused our English tongue to sing and was well aware of his indebtedness. In short, this is a little book blessedly free of whimsy in which it is clear that to the author children and Nature were best evidence of "the day-spring from on high."

We had written thus far when came the sad news of the author's death, which deprives medicine of a singularly gracious influence. As if in anticipation of his approaching end he expresses the hope in one of his last poems

. . . . . .
That so of me,
Shall nothing live that might work other's ill,
No legacy
Of harm to lead one single soul astray,
Thus may it be,
When I shall die.

That wish is fulfilled.

Notes on Books

The Ministry of Health has issued a booklet which is Part I of Emergency Medical Services Instructions and deals with medical treatment in special centres. It is pointed out in a foreword that the instructions have reached such proportions that it has become difficult for those who have to carry them out to see that this is done. The wise decision has therefore been made to consolidate these instructions into booklets, a step which will be welcomed by those whose desks are now beginning to be piled high with leaflets of every description. The booklet just issued covers all the separate instructions on medical treatment and special subjects issued as E.M.S.I.s and E.M.S. Gens. from the beginning of the Emergency scheme until the end of May, 1941, with the exception of E.M.S.I.s 144, 278, and 289. Subsequent amendments and additions will be issued in bulletin form from time to time. The booklet consists of sixty pages, and a detailed contents list makes it easy to find one's way about. The booklet is not on sale generally, but is issued to officers of the Emergency Medical Services only.

An Index of New Remedies, by Mr. W. MAIR, contains a list of recently introduced remedies, together with short notes on the therapeutic purposes for which they are recommended. The desire of manufacturing firms to label their products with names registered as trade marks has always been a major obstacle to the development of any rational nomenclature for new drugs. The situation has been aggravated recently, and in some cases cozens of new names have been devised for the description of a single drug. For example, the index gives a list of 33 proprietary names for sulphanilamide. It is obviously impossible for medical practitioners to keep abreast of nomenclature of such crazy complexity; hence this index is a very useful work of reference. It will at least enable the practitioner to know whether a new name refers to some important therapeutic advance or is merely one more unnecessary alias of some well-known compound. It is published at 1s. post free by the *Scottish Chemist*, 240, Albert Drive, Pollokshields, Glasgow.

A textbook which reaches a seventh edition evidently appeals to the medical public. Prof. LOGAN CLENDENING'S *Methods of Treatment* (Henry Kimpton, 25s. net) now appears with the collaboration of Dr. HASHINGER as editor, and with the help of twelve associates on special subjects is an excellent introduction to modern therapeutics. As before, the first part describes the physician's armamentarium not only of drugs, diet, hydrotherapy, and physical therapy, but also the minor surgical procedures of treatment, such as venesection and blood transfusion, spinal and cisternal puncture, thoracentesis and gastric lavage. The second part is devoted to special discussion of therapeutic measures in particular diseases, and the practitioner will find a readable and reliable account of treatment of the systemic diseases. Tropical diseases are not included under a separate heading. The editor has a strong bias towards the physical side of medicine; not that he neglects the neuroses and psychoneuroses, but he takes what might be regarded as the practical view in discussing and treating them. The physician is to demand of himself the answer to the question, Why is this man unsuited to his world? The individual may have a body which in some way is a drag, or may find the conditions of living and work difficult. Treatment, then, of the psychoneuroses involves taking account of all these aspects of the patient and all the aspects of his work, and endeavouring to establish the patient's relations with reality. Throughout the author introduces appropriately a useful and interesting historical background by quoting classical descriptions of original observers—for example, Withering on digitalis, and Bodington on rest and fresh air for tuberculosis. This book of a thousand pages is worthy of a place in the practitioner's consulting room and will attract and delight by the racy character of the instruction.

Preparations and Appliances

QUININE DIASCORBINATE

Orgakinine (Organon Laboratories, Ltd.) is a new synthetic compound—namely, quinine diascorbinate. It is prepared in ampoules for injection and in tablets for oral use. The latter each contain 36 mg. of quinine base and 39 mg. of ascorbic acid. The manufacturers quote evidence in support of the view that fevers cause loss of ascorbic acid. Parenteral administration of orgakinine is suggested as an improvement on Aufrecht's method of quinine therapy in lobar pneumonia. The tablets are recommended for treatment of colds and influenza. The suggested dosage of six tablets a day would provide about 3 grains of quinine and 0.2 gramme of ascorbic acid.

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PHARMACY AND MEDICINES BILL

A leading article in the *Times* the other day cited the new Pharmacy and Medicines Bill, which received a second reading in the House of Commons on July 8, as an example of hurried wartime legislation. True, the reasons given by the Chancellor of the Exchequer, in his Budget statement, for proposing to take up Parliamentary time just now with a Bill to repeal the Medicine Stamp Duties were hardly convincing. Doctors did not need to be reminded that the Medicine Stamp Duties had become "administratively unworkable" and were largely ineffective in controlling the sale of "quack" remedies, nor were they much concerned with the fact that the Purchase Tax on medicines created the anomaly of a tax on a tax. They were concerned, however, lest the Bill should, in the absence of clauses controlling the sale and advertisement of proprietary medicines, undo even the little that has so far been achieved and encourage the indiscriminate sale and purchase of secret remedies. But the Bill now before the House allays many of these early fears and even promises a greater measure of control than hitherto. It is well known that the medical profession would like to see put into operation all the recommendations of the Select Committee on Patent Medicines of 1914, but experience has shown that such an ideal cannot be attained in one step. The new Bill—admittedly piecemeal legislation—will, if it becomes law, make a useful beginning and pave the way to eventual full control.

Briefly the Bill makes it illegal to advertise remedies for the relief or cure of Bright's disease, cataract, diabetes, epilepsy or fits, glaucoma, locomotor ataxy, paralysis, or tuberculosis, or substances to procure miscarriage. Exceptions are made for advertisements published by a local authority or voluntary hospital or in journals of a technical character for circulation to doctors and other professional classes. The diseases named are substantially those proposed by the Select Committee. The prohibition does not apply, however, to surgical appliances, deaf aids and similar articles, or to articles offered for the cure of habits associated with sexual excess or indulgence. The Bill also forbids the retail sale of medicines on or after January 1, 1942, without the disclosure on the container, wrapper, or label of their composition or active constituents either in specific terms or by reference to the *British Pharmacopoeia* or the *British Pharmaceutical Codex*, unless the medicine is prescribed for the needs of a particular person and supplied for his own use. (This follows the recommendation of the Select Committee.) After September 2, 1941, articles recommended as medicines may not be sold retail by any person who is not a registered medical practitioner, a dentist, an authorized seller of poisons, or a person who has served an apprenticeship and is carrying on business as a druggist at the date of the passing of the Act.

So far so good, but if the provisions of the Bili are to be effective there must be some means of enforcing them, perhaps in the same way as the Food and Drugs Acts are enforced, with an Advisory Committee to watch over administration. Further, it is not sufficient to disclose only active ingredients ; as Sir Francis Fremantle pointed out in the debate, not only should all ingredients be named but the quantities should also be stated. Nor does the Bill say how the ingredients should be described. The disclosure might be in such pseudo-scientific terms as to constitute no disclosure at all. This clause of the Bill, to achieve its purpose, should make it compulsory to describe the ingredients in common terms readily understood by the general public. Finally, it is regrettable that there is no control of what may conveniently be termed "fear advertising"—that is, of advertisements which seek to persuade the public that they may not be so well as they feel. It is to be hoped that these matters will receive attention during the passage of the Bill through Parliament.

HYPOCHROMIC ANAEMIA

The criteria by which authors have collected cases of idiopathic hypochromic anaemia have often been biased by a special interest in individual symptoms such as achlorhydria or dysphagia, and anaemias due to malnutrition or pregnancy have been included in spite of evidence that the anaemia was normocytic. If hypochromic anaemia is to be characterized at all it must be on the basis of the anaemia, and hypochromia must signify that the red cells are incompletely filled with haemoglobin. Ideally it would be defined in terms of mean corpuscular haemoglobin concentration, or the ratio between the haemoglobin content and the mass of the red cells, but such measures require a centrifuge and are likely for some time to be omitted in routine blood examinations. Lundholm[1] therefore quite simply defines hypochromic anaemia as anaemia with a colour index less than 0.75. Although hypochromic anaemia is usually curable by iron, it is by no means synonymous with iron deficiency, for there is no doubt that iron deficiency can exist without anaemia.[2]

Lundholm's material comprised 306 cases, of whom 201 came to hospital for treatment of their anaemia, 71 were discovered incidentally, and 34 were discovered on examining relatives of the patients ; 92% were in women. Lundholm stresses the diagnostic value of the typical facies, by which he means an aged, sallow, wrinkled face which often contrasts with a smooth, white, and transparent body skin. We need not go into his analysis of the haematological data, but will give his figures for the common clinical symptoms, which are achlorhydria (Ewald) in 67% of cases, glossitis in 44%, koilonychia in 42%, typical facies in 35%, Plummer-Vinson syndrome in 19%, and splenomegaly in 9%. These symptoms were all commoner in the more anaemic

[1] *Acta med. scand.*, 1939, Suppl. **102**.
[2] Ibid., 1938, Suppl. **90**, 380.

cases, and splenomegaly was uncommon except in the most severe. Achlorhydria is about twice as common as in the ordinary hospital population. Both achlorhydria and the Plummer-Vinson syndrome cause subjective discomfort which induces the patient to seek advice, and they are therefore more common in patients who come for treatment than in those in whom the anaemia is found by chance. It is clear that achlorhydria is neither the cause nor a *sine qua non* of the anaemia. As achlorhydria is more common when the anaemia is severe, and probably also when it is of long duration, and as a number of the patients lost their ability to secrete hydrochloric acid while under observation, Lundholm is inclined to believe that the anaemia may gradually cause such changes in the mucous membrane of the stomach as result in achlorhydria. The latter may therefore be temporary and reversible to begin with, but later becomes permanent. An alternative hypothesis is that both anaemia and achlorhydria are the result of iron deficiency.

Working with a fairly homogeneous population whose daily intake of iron averaged about 9 mg., Lundholm could find no correlation between diet and anaemia in individual cases. He reviews the various iron-balance experiments recorded in the literature, and shows that the results are often discordant and do not stand close scrutiny. A negative balance of only 1 mg. iron a day would mean the loss of 10% of the body's store of iron in a year; but the relative inaccuracy of the chemical methods, the great variation in the iron content of foodstuffs, the difficulty of differentiating the amount of faeces derived from a given diet, and the inaccuracies in sampling the diet and the excretions, all render it doubtful whether this degree of accuracy can be attained in balance experiments. He concludes that dietetic conditions alone are not a sufficient explanation of the anaemia, nor is it due to the loss of iron in menstruation and pregnancy, for there is no difference in these functions between the anaemic women and those who remain normal. These are merely predisposing factors, and the fundamental fault appears to be a difficulty in absorbing iron from the food or in mobilizing it from the depots. He suggests that this is an inborn error of metabolism, and calls the disease hereditary hypochromic anaemia in consequence. This is probably going too far for most people's taste, but it is to be hoped that this uncompromising title will not prevent his monograph's being studied as widely as it deserves.

In a much smaller series of women in Newcastle-on-Tyne, Khan[3] has likewise shown that there is no close correlation between the incidence of anaemia and the individual intake of iron. No one can put aside the great mass of data which show that the incidence of anaemia in different peoples, and in different sections of the same people, bears a direct relation to the iron content of the diet, but with iron, as with the vitamins, other factors come into play in deciding which particular individuals will develop a deficiency. Achlorhydria and menstrual losses are obviously not the only factors which may determine the onset of iron deficiency on a given diet, and we can say no more about the other factors except that in some cases they appear to run in families.

[3] *Lancet*, 1941, **1**, 11.

AGGREGATION OF TODDLERS

In a recent letter to the *Times* on the provision of nurseries for "under fives," Lady Allen of Hurtwood suggested the "urgent need for the appointment at the Ministry of Health of a second Parliamentary Secretary to initiate experiments, to educate the public, and to focus all aspects of this vital work." This is precisely what, for over half a century, under the expert direction of the medical officers of health throughout the country, has been a main effort of the public health authorities. During this period a vast amount of fact has been accumulated, and, if public assimilation has lagged, some outstanding principles have emerged for the guidance of zealous but uninformed social reformers. "Under fives" of the toddler period were very well provided for, so far as mere buildings and excellent staffing could do this, in the infant departments of the public elementary schools. Yet, as a result of the experience of medical officers of health and school medical officers this excellent provision has largely been abandoned for the all-important reason that it has been found incompatible with the health of those for whom it was made, and even dangerous to life. At the tender ages of early childhood, human beings, like other mammalian species, cannot be aggregated without grave danger. Susceptible to infections to a degree not experienced by older children and adults, toddlers succumb disastrously when, with aggregation, exposure to infection is increased. They contract infections which in later life might be regarded as minor and die from them at a rate that is higher than at any subsequent age period. These are commonplaces of medical knowledge. Yet with the perversity which in England characterizes so much misdirected effort, expert opinion is flouted or ignored, and uninformed philanthropic enthusiasm displaces an equally well-intentioned yet informed and sane direction. For instance, no sooner had success attended the effort to raise the minimum school age than nurseries and crèches, subject to exactly the same dangers as the infant departments for which they were substituted, sprang up like mushrooms everywhere. The fact is that, for some children, care and provision other than that of the mother and the family circle is necessary, and it is this residuum that affords at once excuse and incentive for a campaign for publicly provided nurseries and crèches. Compromise with unavoidable evil may be necessary, but it should not be regarded as a virtue. Since already local authorities have covered the ground, experiment by amateurs in so sensitive a field as that of the unmothered toddler is the less permissible. This is no time for ignorant direction in vital affairs, for by-passing those with knowledge and putting in their place Parliamentary Secretaries who can only properly function when trained and experienced officials continuously inform Ministerial policy. The Ministries abound in technical advisers. Just as in the Army the generals must be unfettered by political interference, so in matters that concern health the medical advisers should not be trammelled by the piling up of Parliamentary Secretaries. Neglect of this elementary principle is bound to yield an aftermath of sickness and deaths which will be revealed in the vital statistics of the coming years. A.R.P. work, uninformed at first by medical direction, has been responsible in certain of its activities for putting back the clock to pre-sanitary days. The nation cannot afford similar mistakes to be made in the care and supervision of infants in the peculiar circumstances of the war. One inexorable fact dominates a situation which no political manœuvring can ultimately disguise. Aggregation of the young in schools, in hospitals, in nurseries, in crèches is unnatural, and this departure from the normal law of domesticity, wherever necessity has imposed it, has

had unfortunate results. The dangers to the highly susceptible children of tender years are such that aggregation should only be sanctioned when unavoidable, and then it calls for the most skilful and knowledgeable control. Far better to subsidize the mothers within the seclusion of temporary homes, if there be occasion, rather than to employ deputies in institutions. A proposal to withdraw little children from the care of their mothers, to aggregate them in tens, in scores, in fifties, under the care of "suitably trained friendly aliens" or others, in order that mothers may engage in war work should be critically watched by the medical profession. It is on record that in the Franco-Prussian War, during the siege of Paris, the infant mortality of that city fell to a phenomenally low figure. This was a result not of the provision of nurseries to relieve mothers of their duties, or to set them free to discharge others for which they were less fitted, but of an enforced reversion to natural maternal conditions where breast-feeding and maternal care were inescapably imposed. This significant historical fact should be well considered.

SULPHANILAMIDE AND SEAWEEDS

The following formula for a satisfactory base for a sulphanilamide ointment appeared recently[1]:

1. Dissolve 10 parts of sulphanilamide in 25 parts of hot water (almost boiling). Filter.

2. To 4 parts of sodium alginate add 75 parts of boiling water, emulsify, and then strain the resulting mucilaginous mixture through fine gauze. Mix the filtered sulphanilamide solution and the sodium alginate while hot, and stir this mixture until cool.

3. Add 16 parts of anhydrous wool-fat, 1 part of sodium chloride dissolved in 4 parts of water, and 78 parts of white petrolatum base to the sulphanilamide - sodium alginate mixture, and mix until smooth.

Subsequently it was stated[2] that the object of this was to get a base for sulphanilamide and its derivatives which would not be greasy and would be non-irritating. Ointments with a base of hydrous wool-fat or cod-liver oil are not used because they tend to "cake" in the wounds. The ointment described here is smooth. Not only has it been used on surface wounds, but it has proved to be non-irritating and non-toxic when applied to mucous membranes such as the conjunctiva and the sclera and cornea. The use of sodium alginate to economize in substances such as glycerin and tragacanth is of particular interest to prescribers in this country. Sodium alginate is manufactured from seaweed, and is mentioned under this heading in the Medical Research Council War Memorandum No. 3, "Economy in the Use of Drugs in Wartime." It has a formula resembling those of cellulose and pectic acid, and is used in industry for stabilizing suspensions and emulsions, thickening solutions, forming gels, and preparing films and coatings. The main disadvantage of sodium alginate, which has hindered its use as a wartime substitute, is that it is chemically reactive, and on this account it cannot replace glycerin and tragacanth in a number of familiar suspensions and emulsions used in medicine. Occasions on which it can be used should, therefore, be the more thoroughly exploited, and this is especially true of sulphanilamide ointment, which is likely to be prepared in bulk and used on a large scale. The economic importance of seaweeds has recently been discussed by Moore,[3] and their uses were described in a presidential address to the Botanical Section of the Southern Union of Scientific Societies by Miss E. M. Delf.[4] Seaweeds have at various times been used as foods for animals and man, as manures, and as sources of potash, soda, iodine, and mucilages. In the animal economy they probably have no caloric value, but serve as flavouring agents and sources of minerals and vitamins. As seaweed is relatively expensive to collect, costing from 12s. 6d. to 15s. a ton to gather and cart only a few miles, the seaweed industry in Great Britain languished when cheaper sources of alkalis and iodine became available. In America, too, the large plant at San Diego, designed mainly for the production of calcium acetate, acetone, and cognate substances from seaweed in 1914-18, was dismantled soon after the end of the war. To-day, however, there are increasing uses for colloids and plastics, and the need for these may revive the seaweed industry once more. Seaweeds differ from other plants in that their supporting tissues contain no lignin or cellulose. Instead, the thick-walled mechanical elements are highly mucilaginous, giving greater flexibility and more elasticity than are found in the tissues of higher plants. These mucilages are of two kinds: *agar*, which is produced from red seaweed, and *algin*, which is extracted from brown seaweed. Agar is closely similar to the gelatinous products derived from carrageen or Irish moss (chondrus, *B.P.C.*). Up to date little success has attended efforts to produce a good bacteriological agar in this country, and owing to the scarcity and dispersion of suitable red seaweed it is doubtful whether it can ever become an economic proposition here. The brown seaweeds from which algin is derived are much more abundant, and it is probable that the future will see increasing applications of algin and its derivatives.

[1] *J. Amer. med. Ass.*, 1941, **116**, 356.
[2] Ibid., 1336.
[3] Moore, L. B., Department of Science and Industrial Research, New Zealand, Bulletin No. 85, 1941.
[4] Delf, E. M., *Proc. Trans. S. U. Sci. Soc.*, 1940, **45**, 15.

MAGNESIUM AND TOOTH FORMATION

Although it has been known for some time that magnesium is a constituent of the inorganic material of teeth, very little experimental work has been done on the effects of a dietary deficiency of this element on the composition and structure of teeth. Watchorn and McCance[5] produced a partial deficiency in young rats by reducing the amount of magnesium in the diet to forty parts per million. The teeth showed an increased water content, capillary dilatation, and reduction of the magnesium content to about one-half after ten weeks on the diet. According to Duckworth and Godden[6] a more severe deficiency (only six parts magnesium per million) in young rats resulted in tetany and death from the sixth day of treatment onwards. These rats grew normally, and their incisors increased in weight, but the total amount of magnesium in the teeth remained constant. Hence, since abrasion of the ends of the incisors was continually going on, there must have been some deposition of magnesium during the deficiency period. Meanwhile the magnesium content of the teeth of the control animals fed on a complete diet had increased. During the same period the magnesium content of the femurs of the animals on a deficient diet fell by about 30%. When the rats were again given magnesium, it was deposited in the teeth and femurs at a normal or slightly increased rate. The histological changes in the teeth during the period of magnesium deficiency[7] involved a change in the calcification rhythm, widening of the predentine, and, in certain parts, shrinking of the odontoblasts. Recovery when magnesium was again given was rapid; the calcification cycle was resumed immediately, the odontoblasts became normal in about six days, and predentine of normal width

[5] *Biochem. J.*, 1937, **31**, 1379.
[6] *J. Physiol.*, 1940, **99**, 1.
[7] Ibid., **99**, 8.

was made. The wide predentine formed during the deficiency was not altered; it was lost only by the continued growth of the rat's tooth and abrasion of the distal end. The behaviour of magnesium in being withdrawn from the skeleton but not from the teeth during a period of deficiency is similar to that of calcium. Gaunt and Irving[8] showed that calcium and phosphorus were withdrawn from the skeleton more than from the teeth, and Schour *et al.*,[9] in experiments on the effects of parathyroidectomy, fasting, repeated pregnancies and lactations on the incisors of over 100 rats found no histological evidence of calcium being taken from the teeth. Thus it seems safe to conclude that both calcium and magnesium stay in the teeth when once deposited there. They are not withdrawn from these organs during a sudden acute deficiency in the diet.

INTRAPERITONEAL GLUCOSE

The technical difficulties and the uncertainties of the intraperitoneal route for the administration of fluids have combined to restrict its usefulness, and it is only rarely employed to-day. Totten,[10] in a review of the literature on the intraperitoneal injection of hypertonic glucose solution, states that the reports and evidence are confusing and conflicting. Buchbinder, using 20% glucose solution intraperitoneally at intervals, found that encapsulation of drains could be prevented and their patency maintained for several days. At the same time a transudate was formed which prevented not only fibrin formation but also the development of adhesions after chemically induced peritonitis. Where there was infection, however, the intraperitoneal glucose led to a more rapid spread of peritonitis. Totten now records the results of a series of experiments in which 20% glucose was injected into animals by the intraperitoneal route. This injection was harmless apart from a controllable degree of dehydration; there was a rapid transudate which was completely absorbed within twenty-four hours, but no formation or re-formation of experimentally produced adhesions. In the presence of peritoneal contamination the glucose solution interfered with the production of fibrin and hastened the spread of peritonitis. It is well that these findings should be confirmed and restated. The potential advantages of controlling fibrin formation and the development of adhesions by a "wet" peritoneum will be greatly outweighed by the added risks of spreading any infection and of inhibiting localizing processes. The control of infection remains a much bigger problem than the control of adhesions.

VASCULAR SURGERY

The name of Dr. Rudolph Matas is an honoured one in the field of international surgery and of outstanding importance in the sphere of vascular surgery. It is all the more honoured since he started his internship at the Charity Hospital, New Orleans, in the year 1877, at the dawn of the Listerian era, and he is still contributing to the subject he has made so much his own. The unsettled conditions which prevailed in the State of Louisiana during the early part of last century provided surgeons with opportunities for treating many wounds of the peripheral blood vessels and their sequelae. Thus the surgeon's traditional interest in this field was maintained and continued at a time when abdominal and other branches of surgery were claiming more and more adherents. It is worth remembering that in the past the surgeons who achieved the greatest international fame were those who had won their reputations largely through their own work in the surgery of the blood vessels. Matas's early training and experience were thus in a school where the surgery of vascular lesions was a day-to-day problem. In 1888 he carried out the first endo-aneurysmorrhaphy for the treatment of aneurysm and reported the case in the same year. The *Annals of Surgery* for November, 1940, which is a symposium on aneurysms and vascular surgery, contains a review by Matas of a personal series of 620 operations performed upon the blood vessels for all causes between the years 1888 and 1940, a further article from him on aneurysm of the abdominal aorta at its bifurcation into the common iliac arteries, and contributions from other workers on various aspects of vascular surgery and the treatment of aneurysms. Of Matas's total of 620 operations, 417 were on the common carotid or its branches and 203 at other sites, while 260 were for aneurysm and 360 for other conditions. The different anatomical sites and the operative and technical details are analysed and classified. Suture methods were employed in 101 cases, and ligation, including aluminium bands, in 519. There were only thirty deaths in the series, or a mortality of 4.83%. This detailed record, which concludes with a list of 108 contributions by Matas to the literature of vascular surgery, is a monument to his wide clinical interests, technical skill, and critical and scientific outlook. His work has served and should still serve as an inspiration and encouragement to younger men the world over.

CALCIUM THERAPY IN CARDIAC FAILURE

Lauder Brunton, in 1907, recommended calcium chloride for the treatment of cardiac failure. A synergic action on the heart by calcium and digitalis was demonstrated a few years later by A. J. Clark,[11] and O. Loewi[12] advanced the theory that the action of the digitalis depended on sensitizing the heart to calcium ions. During the last twenty years the action of calcium, with or without digitalis, in cardiac failure has been investigated by many authors, but the results have varied widely. There is a fairly general agreement that calcium salts given orally are not effective, but that intravenous injections cause slowing of the heart rate. This method calls for caution because rapid administration may lead to severe toxic manifestations. The introduction of calcium gluconate, however, has greatly facilitated intravenous administration. Rogen[13] gave this preparation to forty-one patients with varying degrees of cardiac failure, and in most of them there was a notable slowing of the pulse. This was much greater where the rhythm was regular than in cases of auricular fibrillation. The effect is probably due to vagal stimulation, because in ten cases out of fifteen in which atropine was previously given there was no calcium bradycardia. Clinical improvement was noted in fourteen cases, and the author concluded that intravenous cardiac therapy should be adopted for patients with cardiac decompensation who have not responded to digitalis.

At the quarterly meeting of the Council of the Royal College of Surgeons of England on July 10 Sir Alfred Webb-Johnson, C.B.E., D.S.O., was elected President for the ensuing year, in succession to Sir Hugh Lett, Bt.

[8] *J. Physiol.*, 1939, **95**, 51P.
[9] *Amer. J. Path.*, 1937, **13**, 945.
[10] *Surgery*, 1940, **8**, 456.
[11] *Proc. roy. Soc. Med.*, 1912, **5** (Therap. and Pharm. 181).
[12] *Arch. exp. Path. Pharm.*, 1918, **82**, 131.
[13] *Glasgow med. J.*, 1940, **134**, 147.

CHEST SURGERY IN WAR

This is one of a short series of articles based on lectures given at the British Postgraduate Medical School, Hammersmith

SOME ASPECTS OF CLOSED WOUNDS OF THE CHEST *

BY

J. G. SCADDING, M.D.

Major, R.A.M.C.

Suggested Programme of Treatment

Prophylactic chemotherapy should be given as early as possible in every case, on lines similar to those recommended for other war wounds (Fuller and James, 1940). The possibility of prophylactic local application of sulphonamide drugs to the pleura by injection of suspensions of the drugs in a suitable vehicle seems as yet to be unexplored; local application to wounds elsewhere has been successfully used. Though local application to the pleura in cases of established infection with empyema has been disappointing, the method seems well worthy of trial as a prophylactic against the development of infection.

Immediate surgical treatment is necessary for cases showing the indications already described under "Surgical Intervention." Wherever possible, this and other forms of treatment should be planned after study of radiographic appearances.

In cases with "closed" wounds not showing indications for immediate surgical intervention, and those in which after necessary surgical treatment the chest has been closed (according to the indications outlined above), treatment should be planned to keep the pleura free from blood and exudate by aspiration, and to manage the pneumothorax most advantageously. These questions receive further consideration below.

Surgical intervention on the usual lines is required later for such conditions as empyema, pulmonary abscess, etc.

Management of the Closed Thorax after Penetrating Wounds

In most cases there will be varying amounts of blood and air in the pleura. The advantages of keeping the pleura free from blood and exudate seem overwhelming; the risk of infection, especially by anaerobic organisms, developing in spite of prophylactic chemotherapy is probably much less, and the occurrence of disabling pleural thickening and pulmonary fibrosis by partial organization of the slowly absorbing blood and exudate is avoided. The drawbacks are that unless efficiently performed early aspiration may be exhausting to a shocked patient; that aspiration may be difficult on account of fibrin clot which blocks the needle; and that simple aspiration may result in the recurrence or increase of bleeding by causing re-expansion of the partially collapsed lung. The latter danger may be avoided by air replacement at all early aspirations; this should certainly be done if there is evidence of pulmonary haemorrhage in the form of bright haemoptysis. With these points in mind the following list of indications may be suggested:

(i) *Aspiration and Air Replacement.*—These are indicated in all cases in which within a few days of wounding there is a considerable haemothorax. The indication for air replacement is not so strong if no haemoptysis occurs, but if there is haemoptysis early aspiration should be accompanied by air replacement. Air replacement is contraindicated if there is evidence of a pleural infection.

(ii) *Simple Aspiration.*—This is required in cases seen later in which there are signs of considerable effusion into the pleura but without haemoptysis, and in cases in which a pneumothorax has been present for several days, haemoptysis has ceased, and there is a reaccumulation of fluid, especially if the temperature and pulse are rising, suggesting incipient infection. In the latter type of case the object of treatment should be to secure re-expansion of the lung to minimize the size of the empyema that may develop.

(iii) *Artificial Pneumothorax.*—The cases considered under heading No. i will be left with an artificial pneumothorax. In a few instances a wound of the lung may be causing haemoptysis without any considerable haemothorax or traumatic pneumothorax. In these, if haemoptysis continues, the formal induction of an artificial pneumothorax may be a very satisfactory line of treatment. In any case, when an artificial pneumothorax is induced by either of these methods it should be maintained for a few days only; possibly no refill, or at most only one, will be required. As soon as active pulmonary haemorrhage has ceased, as shown by the disappearance of bright blood from the sputum, no further refills should be given, and the lung must be allowed to re-expand slowly by spontaneous absorption of the air in the pleura. The value of artificial pneumothorax has been emphasized, on a basis of practical experience, by Kretzschmar (1940).

Technique of Aspiration

A few words about the technique of aspiration of the chest may be useful. Three points require attention: first, the patient must be supported comfortably in a convenient position, both so that he is not exhausted by the effort of maintaining it and so that the operator is not incommoded by difficulty of access to the chosen site; secondly, the common error of inserting the needle too low must be avoided; and, thirdly, a needle of adequate bore for the type of fluid present must be used.

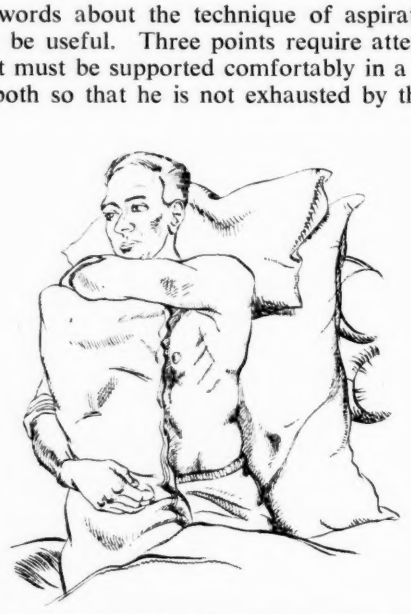

FIG. 2.—A useful position for aspiration of the chest, air replacement, etc.

Posture.—There may be factors, such as the site of external wounds, which influence decision about the most suitable posture. In most cases, however, that shown in Fig. 2 is possible and is very convenient. The patient sits propped up in a rather upright Fowler's position; with the arm of the sound side he clasps a blanket or blankets rolled into a cylinder about sixteen inches to eighteen inches

* Concluded from p. 58.

long, while the arm of the affected side is placed so that the hand rests on the opposite shoulder and the elbow rests on the top of the rolled-up blanket. This posture leaves the whole of the lateral wall of the chest accessible to the operator sitting by the bedside. It can be maintained without distress even by an ill patient.

Insertion of Needle.—In most cases of effusions into a free pleura the needle should be inserted in the fifth or sixth intercostal space in the mid-axillary line with the patient in the position described. The disadvantage of inserting the needle lower than this is that it is apt to get intermittently blocked by the diaphragm at the height of its excursion, that fibrinous particles are more numerous in the costo-phrenic "gutter," and that this "gutter" is in any case more narrow in its lower part, so that it may easily be almost obliterated by fibrinous deposit on the pleura. These troubles are minimized by inserting the needle higher up; if this has been done the last part of the fluid may be withdrawn by leaning the patient over towards the affected side.

Size of Needle.—The importance of using a needle of adequate bore seems too obvious to require emphasis. There is one difficulty, however—namely, that most large-bore needles are made much longer than necessary for pleural aspiration. Those supplied with most of Potain's aspirator sets are an example of this. Very few chest walls require a needle more than two inches in length; and unnecessary length partly defeats the purpose of a wide-bore needle by increasing the resistance to flow. Aspiration of a haemothorax may prove very difficult on account of repeated blockage of a needle of the usual sort, even of wide bore. In such cases it is tentatively suggested that larger trocars and cannulae, such as are used for the insertion of intercostal catheters or for thoracoscopy, might be tried. A trocar and cannula of this size can be inserted painlessly if the technique is sufficiently careful. The chosen site must be adequately anaesthetized, 20 c.cm. of local anaesthetic solution being required; the presence of fluid is confirmed; a small incision is then made with a fine scalpel or tenotomy knife, and through this the trocar and cannula are steadily thrust between the ribs into the pleural space. Aspiration through such a large cannula, if thoroughly performed, would rarely need to be repeated. It might be advisable to irrigate the pleura with normal saline at the end of such an aspiration to ensure that no fibrinous debris is left to interfere with subsequent aspiration through a more normal needle, should it prove necessary. During this procedure the interpleural pressure should be controlled by introducing or removing air through a second needle inserted higher up, as described below under "air replacement." After withdrawal of the trocar the small wound should be closed by a single stitch, and a dressing, firmly supported by elastic plaster, applied.

Technique of Air Replacement

Air replacement requires, in addition to aspirating apparatus, devices for measuring the intrapleural pressure and for admitting air, preferably in measured volume, into the pleura. These are, of course, both provided by any form of apparatus used for artificial pneumothorax work. Preparations having been made for aspiration as outlined above, a second needle is introduced, in the manner described for measuring the intrapleural pressure, higher up above the level of the fluid. Through this, as the fluid is withdrawn through the lower needle, air is admitted at such a rate that the intrapleural pressure is kept as constantly as possible at the desired level. The pressure required in the individual case can be judged from the degree of lung collapse initially present and the initial pressure before aspiration is begun. In general, in order to maintain constant pressure within the pleura rather less volume of air must be introduced than fluid withdrawn. The pressure required to produce a useful degree of lung collapse varies greatly: it will always be below atmospheric in men with previously healthy lungs—generally the mean pressure will lie between 0 and −4.

If a pneumothorax apparatus is not available the pressure may be measured with the manometer described on page 57, and the aspiration stopped occasionally to allow air to be injected through the lower (aspirating) needle with a large syringe, the amount being controlled by observation of the intrapleural pressure. This is a safe procedure, provided it is certain from the free flow of fluid on aspiration that the needle is in the fluid-containing space.

If there is a large haemothorax with no considerable air space above it, and an air replacement is indicated, the easiest procedure is to start as for simple aspiration. When about 100 c.cm. of fluid has been withdrawn inject 80 c.cm. of air through the aspirating needle, and continue thus until a useful air space is present above the fluid. Insert the upper needle into this, and proceed as in the cases with an initial air space.

Infection.—This complication should be watched for throughout. So long as fluid accumulates in the pleura specimens must at intervals be examined bacteriologically, by both aerobic and anaerobic culture, especially if the temperature rises or fails to fall. It is to be hoped that the incidence of infection will be reduced to a very low level by prophylactic chemotherapy and thorough early aspiration. When it occurs the case must be treated on the general principles of the treatment of pleural infections, which cannot be discussed here. It may be stressed that so long as there is a pyothorax—i.e., a collection of purulent fluid in a free pleura—aspiration or drainage by an efficiently closed method must be used; only when the condition has settled into a localized walled-off empyema may an open method of drainage be employed.

Tension Pneumothorax

This is a rare complication of chest wounds; it results from a pleuro-bronchial communication of valvular type, so that air can enter the pleura in inspiration and cannot leave it during expiration. The pleura thus becomes distended by air under pressure, causing gross mediastinal displacement and dangerous respiratory distress.

The presence of a tension pneumothorax may be suspected when there is extreme respiratory embarrassment with cyanosis, and on examination the affected side of the chest is immobile, possibly distended, hyperresonant on percussion and either silent or (rarely) with curious amphoric respiratory sounds on auscultation, and the heart and possibly the trachea are displaced on the opposite side. The diagnosis is made precise by measurement of the intrapleural pressure, which will be above atmospheric.

Such a case calls for immediate measures for its relief. In emergency, with no apparatus to hand, relief may be obtained by simply thrusting a needle into the pleura through one of the upper intercostal spaces. The outward hiss of air is easily audible if a tension pneumothorax is present, and confirms the diagnosis. This simple insertion of a needle brings the intrapleural pressure to atmospheric, and results in considerable relief of urgent symptoms. If the apparatus is available more information about the size of the valvular opening may be obtained by measuring the pressure, withdrawing a measured volume of the pleural gas to reduce the pressure a little below atmospheric, and watching for a time to see whether the pressure rises again. If it does not the needle may be withdrawn and the patient watched for recurrence of distress. If the pressure mounts rapidly or, after the needle has been withdrawn, distress

recurs rapidly, a suitable needle may be inserted and connected to a rubber tube attached to a simple under-water drainage bottle as used for closed drainage of empyemata (Fig. 3). This will afford great relief, but has the disadvantage that, as air is expelled during cough, it may result in the development of a low intrapleural pressure, with too rapid re-expansion of the lung, giving the pleuro-bronchial fistula no chance to heal. It may be more satisfactory, in a patient who is not distressed by an intrapleural pressure equal to atmospheric, to leave a needle *in situ* open to the air, preferably through a loose cotton-wool filter. If, however, the patient is distressed with an atmospheric intrapleural pressure the arrangement shown in Fig. 4 may be used. In this, bottle B is added to the simple under-water drainage bottle A to act as a safety-valve, letting air into the system whenever the pressure gets below a level equal to that number of centimetres of water below atmospheric by which the tube C projects below the surface of the water in bottle B. This is of course adjustable to whatever level is required for relief of the patient's discomfort. The rather more complicated apparatus described by Marriott and Foster-Carter (1940) may be used for the same purpose.

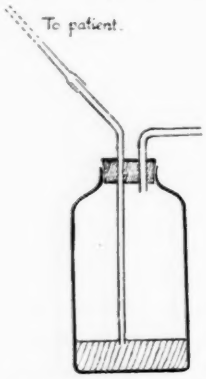

FIG. 3.—Simple under-water drainage bottle.

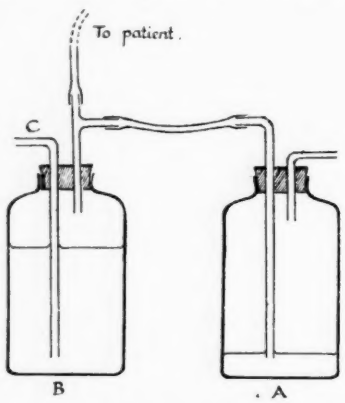

FIG. 4.—Apparatus for under-water drainage of tension pneumothorax, with safety-valve.

In general, in the treatment of valvular pneumothorax as little air as possible should be withdrawn or the pressure maintained as near atmospheric as it can be, in order to keep the lung as firmly collapsed as is consistent with the patient's comfort, since only thus has the pleuro-bronchial opening the best chance of healing. In valvular pneumothorax due to wounds surgical intervention will often be indicated; but the measures outlined above may be necessary life-saving preliminary steps.

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HEALTH INDICES FOR GREATER LONDON AND NEW YORK, 1931-40

BY

PERCY STOCKS, M.D., F.S.S.

Medical Statistician, General Register Office, London

In a leading article (*Journal*, February 8, p. 201) dealing with the provisional notification and death rates from certain causes in the city of New York for the year 1940 regret was expressed that no recent death rates were available for London with which these could be compared. The February issue of the Quarterly Bulletin of the Health Department of New York City contained the death rates in each year from 1931 to 1940, at appropriate ages, from diphtheria, scarlet fever, measles, whooping-cough, tuberculosis, pneumonia, appendicitis, suicide, homicide, accidents, and some other causes. Greater London and New York are at present not far apart in their total populations, and it is of interest from a public health standpoint to compare the changes which have occurred in the death rates from these causes in the two cities since 1931. In such a comparison it must be remembered that while the New York figures do not include deaths of residents which occurred outside the city and do not exclude those of non-residents which occurred within the city, the Greater London rates have been corrected for inward and outward transfers and represent the total mortality suffered by residents. The effect of this can be illustrated from the following example. In 1940, 227 deaths from diphtheria, scarlet fever, measles, and whooping-cough were registered in Greater London, but of these only 104 were of residents; in addition 163 deaths of Greater London residents from these causes were registered in other administrative areas of England and Wales, making a total of 267 residents, compared with 227 registrations. If the same conditions hold for New York this would account for an apparent excess of 18% in the combined rate for these diseases in Greater London, but if a larger proportion of New York's infectious disease hospitals lie outside the city's boundaries a still greater apparent excess might result. The same considerations apply to tuberculosis, from which cause a large proportion of deaths of town dwellers occur in institutions situated in the country, and unless these are transferred to the towns of residence the death rates of the latter are fictitiously low. In New York it has been ascertained that the addition of deaths from tuberculosis of residents occurring outside the city would increase the rates by about 10%. Causes such as pneumonia and appendicitis are not likely to be affected to the same extent, but the general death rate of Greater London is raised appreciably by the process of allocation of all deaths to the place of residence of the deceased. In the December quarter of 1939, for example, 19,309 deaths from all causes were registered in the area, 6,360 of these being of non-residents, while 7,512 residents died elsewhere; the corrected death rate was consequently 6% in excess of the uncorrected rate.

Since it is uncertain to what extent the New York death rates are understated owing to this absence of correction, the best method of comparing the progress made in the two cities since 1931 is to study the changes in the *ratio* of the Greater London death rate to that of New York. Changes since 1931 in the distribution of hospital cases in and around New York are unlikely to have seriously affected the ratio, and if it has consistently increased the conclusion may be drawn that progress in reducing mortality from the disease in question in Greater London has not kept pace with that in New York, and vice versa.

For diphtheria the London/New York ratio in 1931-4 ranged from 2.0 to 6.5, but in 1937-40 it ranged from 6.0 to 8.6, for whilst New York has reduced the toll of this disease by more than 85% since 1932, Greater London's rate has fallen by little more than half. For scarlet fever, however, the ratio has not changed consistently, the average death rate in Greater London having fallen from 66 in 1931-4 to 15 in 1937-40 and in New York from 49 to 12—that is to say, by more than 75% in each city.

Diphtheria and Scarlet Fever. Death Rates per Million Children Under 15 Years of Age

Year	Diphtheria			Scarlet Fever		
	Gr. London	New York	Ratio	Gr. London	New York	Ratio
1931	242	110	2·2	58	50	1·2
1932	251	124	2·0	66	79	0·8
1933	330	51	6·5	67	35	1·9
1934	450	61	2·4	75	31	2·4
1935	293	40	7·3	27	45	0·6
1936	224	21	10·7	36	38	0·9
1937	216	36	6·0	29	19	1·5
1938	219	36	6·1	19	11	1·7
1939	116	16	7·2	7	10	0·7
1940	121*	14	8·6	7*	9	0·8

* Provisional rates.

For measles the annual London/New York ratio has fluctuated greatly owing to epidemics occurring in different years, but when the average rates in 1931-4 and 1937-40 are compared it is evident that a parallel decline in mortality of children under 5 has occurred in the two cities, the London rate remaining at 5 times that of New York. For whooping-cough a slight fall has taken place in the ratio in recent years.

Measles and Whooping-cough. Death Rates per Million Children Under 5 Years of Age

Year	Measles			Whooping-cough		
	Gr. London	New York	Ratio*	Gr. London	New York	Ratio*
1931	221	252		817	403	2·0
1932	1,871	112	5·1	904	281	3·2
1933	187	428		880	257	3·4
1934	2,003	52		731	221	3·3
1935	56	228	3·8	444	321	2·8
1936	1,505	185		757	107	
1937	75	61		634	106	2·7
1938	579	93	4·9	285	233	
1939	11	2		399	87	2·4
1940	132+	7		70+	108	

* Ratio of average annual rates + Provisional.

Greater London's tuberculosis death rate in 1931 was 1.27 times that recorded for New York, but as it is estimated that the latter would be increased 10% by inclusion of deaths of New York residents occurring away from the city, the real excess in the crude death rate must have been about 15%. The ratio declined from 1.28 in 1933 to 1.10 in 1936, indicating a more rapid improvement in London in that period and bringing the crude death rate to equality with that of New York. Since 1936, however, the ratio has risen again year by year to 1.23 in 1939, this being due to an accelerated decline in New York in recent years combined with a setback in London in 1939.

Tuberculosis and Pneumonia. Death Rates per Million Persons of All Ages

Year	Tuberculosis (All Forms)			Pneumonia		
	Gr. London	New York	Ratio	Gr. London	New York	Ratio
1931	893	704	1·27	881	1,323	0·67
1932	825	645	1·28	747	1,113	0·67
1933	831	647	1·28	736	1,086	0·68
1934	776	621	1·25	728	948	0·77
1935	700	610	1·15	591	891	0·66
1936	702	636	1·10	709	908	0·78
1937	684	588	1·16	740	896	0·83
1938	626	525	1·19	630	649	0·97
1939	640	520	1·23	555	576	0·96

New York's pneumonia death rate was much above that of Greater London during 1931-5, but in the short period 1936-8 the excess was reduced until approximate equality was attained in 1938 and 1939. There can be little doubt that this achievement may be credited to the great efforts made in the United States to combat pneumonia by serum therapy, and that the parallel decline noticeable in both cities since 1938 reflects the application of the new discoveries in chemotherapy.

Another cause from which New York has for long recorded a much higher death rate than London is appendicitis, but, as in the case of pneumonia, the rate of improvement since 1931 has been more rapid in the former city, with a resulting increase in the ratio between the average annual death rates from 0.47 in 1931-3 to 0.55 in 1934-6 and 0.57 in 1937-9.

Appendicitis. Death Rates per Million Persons of All Ages

Year	Gr. London	New York	Ratio	Year	Gr. London	New York	Ratio
1931	75	166	0·45	1936	72	145	0·50
1932	74	151	0·49	1937	72	129	0·56
1933	78	162	0·48	1938	68	113	0·60
1934	75	141	0·53	1939	60	109	0·55
1935	80	128	0·63				

The suicide rate (which in Greater London is not appreciably affected by allocation of deaths to the place of residence) was high in both cities during the years of economic depression, but since 1934 there has been little change, the London rate being about four-fifths of that in New York. For other violent deaths the ratio has tended to increase, Greater London's death rate being 54% of that in New York in the years 1931-2, rising to 68% by 1939. Correction of this death rate by allocation to place of residence brings about an increase of 6% in Greater London, and if the same is true of New York the corrected ratios will be 6% less than the figures tabulated.

Suicides and Other Violent Deaths per Million Persons of All Ages

Year	Suicide			Other Violence		
	Gr. London	New York	Ratio	Gr. London	New York	Ratio
1931	135	215	0·63	401	747	0·54
1932	154	227	0·68	376	690	0·54
1933	154	190	0·81	406	675	0·60
1934	149	174	0·86	409	691	0·59
1935	128	163	0·79	378	656	0·58
1936	125	155	0·81	385	639	0·60
1937	134	157	0·85	383	627	0·61
1938	134	171	0·78	350	566	0·62
1939	124	162	0·77	390	573	0 68

Turning finally to infant mortality rates from all causes, 22,934 deaths of infants under 1 year of age occurred in New York City in the period 1934-8, and when all deaths in New York State had been allocated to the place of residence the number was 22,744, or 1.7% less.[1] Births were affected to a similar extent, however (504,436 being reduced to 497,504, or by 1.4%), and the infant mortality rates based on live births may be regarded as free from any substantial error and comparable with those of Greater London. The increase in the ratio since 1935 shows that London has not kept pace with New York in its recent reduction in infant mortality, for whereas Greater London's

Infant Mortality per 1,000 Live Births

Year	Gr. London	New York	Ratio	Year	Gr. London	New York	Ratio
1931	59·0	55·6	1·06	1936	56·5	45·6	1·24
1932	59·6	50·9	1·17	1937	53·9	43·7	1·23
1933	54·2	53·2	1·02	1938	49·7	38·3	1·30
1934	57·2	52·2	1·10	1939	43·5	37·1	1·17
1935	51·2	47·6	1·08	1940	47·4*	34·9	1·36

* Provisional estimate.

average rate in 1931-3 was 8% above that of New York, the excess was 13% in 1934-6 and 24% in 1937-9. War conditions must inevitably further retard improvement in the London rate and increase the widening gap for the time being, but when the reconstruction period is reached careful consideration will need to be given to the reasons why New York began to draw ahead about 1936 in this important matter of infant survival, notwithstanding a more difficult climatic and racial background. The average annual death rates per 1,000 live births in the five years 1934-8 from some of the important causes are compared below:

	Greater London	New York
Prematurity	13·2	13·7
Injury at birth	2·4	4·6
Congenital malformations	5·3	4·8
Congenital debility	1·5	0·5
Diarrhoea and enteritis	8·6	4·7
Diseases of respiratory system	10·6	8·9
Other causes	12·1	6·6
All causes under 1 year	53·7	45·7
,, ,, under 1 month	24·1	28·1
,, ,, 1–12 months	29·6	17·6

[1] Births, Stillbirths, Maternal Mortality, and Infant Mortality; New York State, 1934-8. State Department of Health, 1940.

Greater London's post-natal death rate compares favourably with New York, the excess being amongst infants between 1 month and 1 year of age, and towards the total excess of 8 per 1,000 live births diarrhoea and enteritis contribute one-half and pneumonia and bronchitis about one-fifth. Infantile diarrhoea is sometimes regarded as a subjugated disease which has ceased to be an important cause of death, but it is well to realize that 8 or 9 infants out of each 1,000 born are still being certified as dying from this cause in London. Small though this may appear in comparison with figures of thirty years ago, the time for complacent self-congratulation on past achievements in public health has surely come to an end, and the point to be considered is why that which is being achieved now in New York cannot be also achieved in London. A keen rivalry between cities in the matter of their health indices, particularly for infants and children, comparable to what we have witnessed in the financial and other phases of our war efforts, should be our aim in the future, and in the case of Greater London, with its complex administration, this will entail team-work if New York's health record is to be overtaken in the post-war period.

HOSPITALS AND AIR RAIDS

ORGANIZATION OF A CITY CASUALTY HOSPITAL

It is the aim of our wartime medical services, albeit in the face of new, varying, and often difficult conditions, to provide with as little delay as possible the best possible initial treatment and to secure the fullest possible restoration to health and efficiency for each individual casualty. Stresses and numbers may sometimes necessitate, but must not become an excuse for, lower standards. Planning in advance can achieve much, but plans must be elastic and susceptible of quick change. Mistakes must be freely admitted and experiences constantly shared. Those severally responsible for the collection, transport, and treatment of wounded should have a proper understanding of each other's tasks and difficulties. More intensive aerial bombardment may yet await us.

In these notes the organization of a city hospital for the reception, treatment, and evacuation of casualties and associated duties are briefly reviewed. The notes are based on experience gained at a London teaching hospital working as a casualty clearing station and possessed, therefore, of the advantages of an ample student personnel for the provision of dressers, clerks, stretcher-bearers, runners, etc. The assistance which students have given can scarcely be overstressed. It is fully appreciated that, with their different constitution and prevailing shortage of male civilian personnel, other types of hospital must needs employ alternative measures. The suggestions outlined, however, with local variations, should be generally applicable to most large city hospitals equipped for the direct admission of casualties on a large scale.

It is well worth considering application to local Scout organizations for the night-time services, in return for supper and breakfast, of squads of Rover Scouts to assist with such duties as those of stretcher-bearer, tally clerk (for stretchers and blankets), or runner. For help as well as training the presence of St. John Ambulance men can also be arranged. As many wheel-trolleys as possible should be accumulated to lighten the work of the bearers.

In hospitals serving cities already bombed or liable to be bombed provision must be made for: (1) reception of cases from the ambulance; (2) preliminary inspection of injuries in the receiving room followed by administration of A.T.S. (unless it be decided to make a routine of giving it in the theatre when the patient is under the anaesthetic), the sorting of cases into categories according to severity, and the recording of particulars; (3) resuscitation; (4) operation; (5) subsequent treatment; (6) evacuation to a "base" hospital; and (7) mortuary identification and disposal.

Ideally the personnel required on duty at night during a raid in a hospital capable of receiving up to or over 100 casualties should include: (1) a Medical Officer in Charge of staff rank; (2) a senior member of the surgical staff to supervise the surgical decisions of the resuscitation ward, the theatre, and the surgical wards generally; (3) operating surgeons sufficient for the available tables, say from three to five, preferably men of the standing of surgical registrar and sometimes including members of the general or specialist surgical staff; (4) a staff physician in charge of the resuscitation ward and for consultation with the surgeon in cases of wound shock or of chest or neurological injuries; (5) a receiving-room officer—either a member of the specialist staff or an experienced senior house-surgeon; (6) anaesthetists, of whom one should, if possible, be of staff and one of junior staff rank; (7) a radiologist or experienced radiographer; (8) house officers; (9) matron, sisters, nurses, and almoners; (10) engineering and domestic staff, porters, stretcher-bearers, and fire-watchers.

Duties of Senior Officers

1. The Medical Officer in Charge has numerous functions to perform during an air raid. He should be assisted by a responsible secretary or telephonist and a runner: the first of these at his office or night control room, the second either at the control room and kept informed as to his moves or accompanying him on his rounds. He must keep an eye on the number and rate of admissions, and when the hospital's capacity from the point of view of efficient surgery is nearing saturation must make contact by telephone (when possible) with Controls or through the local police with the ambulance service, or with a neighbouring hospital, stating his desire to divert convoys. In practice direct communication in any case with the neighbouring hospital is valuable in order to maintain a friendly reciprocity and to discover how far its staff may be working under stress or able and willing to receive. If other means of communication fail messages should be sent by a returning ambulance. He must tour the wards frequently during the raid to see that all is well and to reassure and encourage nursing staff and patients. It may be necessary for him to visit other parts of the institution or to look into some reported incident or difficulty. He may have to order the evacuation of a ward which has sustained damage or had its windows blasted, or call up extra personnel to deal with incendiary bombs, or summon the fire brigade. He must keep in touch with the matron and with the hospital engineer, who is one of his most valuable lieutenants and under whose direction the fire-watchers and their reliefs should usually be disposed. He must see that operating surgeons and theatre and resuscitation ward staff are relieved without undue delay after an all-night session. He must consult with the surgical officer in charge on matters of policy, and particularly in regard to the pressure of work and the evacuation of casualties on the following day.

2. The surgical O.C. visits the resuscitation ward (which should be a separate unit but as conveniently situated as possible for both the theatre and other casualty receiving wards) as soon as it begins to fill. He should there keep the personnel to a reasonable minimum to avoid congestion and the "too many cooks" tendency. When the first admissions have been attended to and have begun to benefit from the rest and warmth he should make a systematic tour of inspection, dictating a statement of the injuries in each case, ordering in consultation with the physician-in-charge (who remains in the ward) a transfusion here, a dressing or a dose of morphine there, marking up cases for examination with the portable *x*-ray plant, and entering against the names of the operating surgeons on a conveniently placed blackboard at the entry to the ward the bed-numbers of the cases selected for them in order of need and paying due regard also to the skill and experience of the individual surgeons. He has the same functions to perform in respect of the ward or wards to which the less severe cases are admitted and from which cases are drawn for the theatre pending the resuscitation of the more severe. The graver cases may be conveniently returned after operation to the resuscitation ward to ensure continuity of treatment. He may at intervals give advice in the theatre, and when admissions are few or his other tasks are done he may elect to take a table himself for a selected case or cases. Operating should never, however, be considered his prime function. On the morning following a raid he should help his operating colleagues and their house-surgeons with the selection of cases for immediate evacuation, and he may here need to be guided

by the situation and " bed state " as put to him by the medical officer in charge. It is most important for him to establish communication with surgeons responsible for special lesions in special centres with regard to consultations on or transfer of cases of neurological, thoracic, or facio-maxillary injury.

3. The physician in charge of the resuscitation ward has a special responsibility on the spot for all the more serious cases and (with a transfusion officer or experienced resident to help him) for the transfusion of blood, plasma, or other fluids, or the withholding of these. He directs the sister in charge of the ward in the matter of fluids to be given by mouth or rectum, the administration of oxygen, and the undressing or movement of patients—decisions of considerable moment with the badly shocked cases. He should supervise the keeping of records with full notes of pulse, blood pressure, haemoglobin estimations, vomiting, blood loss, etc., in all grave cases, and should assist his surgical colleague with the difficult decisions as to the optimum time for operation—decisions which his closer and more continuous contacts will materially assist. When the admissions are few he should take the opportunity of making detailed continuous observations on a selected case or cases with a view to increasing his own and the general body of information on the varied manifestations composing the picture of traumatic shock and to advancing treatment. In this work valuable guidance may be obtained from the Shock Committee of the Medical Research Council. His judgment should be sought in the case of thoracic wounds and cranial or other neurological injuries. It has not been found necessary to arrange for separation of the sexes in the resuscitation ward; uniformity of administration and treatment and valuable economy in time and skilled personnel can thus be secured.

4. The receiving-room officer, who should be assisted by a sister and nurses and where available by a junior house officer or by students, and also by the almoner's clerical staff and a sufficiency of stretcher-bearers, should make only a very superficial examination of the casualties, his aim being to decide whether they should be admitted to the resuscitation or casualty ward in the case of stretcher casualties, or to a casualty ward or rest room for discharge in the morning in the case of the walking wounded. At this stage it is quite impossible to form any considered judgment of extent of wounding, operability, etc. Approximately ten minutes per ambulance load of four stretcher cases for his inspection and decision, for the administration of A.T.S. (if given at this stage), and for the taking of particulars should suffice once his team is trained. He may judge that a case is too bad for any of these formalities and pass it direct to the resuscitation ward; in this event it is the duty of the almoner's clerical staff to follow and secure the particulars later. He should err in the direction of sending lighter cases for resuscitation rather than in that of burdening the other wards with serious cases. Among the admissions will be many not requiring operation—concussions, severe bruisings, fractured ribs, simple fractures, etc. It has been found that about 50% of all admissions require operation. Upwards of 25% of all admissions may require resuscitation. A resuscitation ward in a hospital equipped for 100 or more casualties should, therefore, when possible, accommodate between twenty and thirty patients and include a side room for necessary equipment.

Radiography

Out of consideration for the patients, and to lighten the task of the stretcher-bearers and preserve quiet and diminish traffic in wards and passages, radiography by night should be carried out with the portable apparatus. Casualties requiring a fuller examination will generally be in a fitter state for this on the following day.

Identification and Other Mortuary Duties

Unless the mortuary is conveniently situated and commodious, separate accommodation must be set aside for persons brought in dead or dying during the night. With an admission of 100 there may be from ten to twenty persons dead on arrival or dying soon afterwards. A most unpleasant but very important duty is that of cleaning up these pitiful victims to make them presentable for those who come to identify them later in the night or in the morning, of carefully collecting and making an inventory of their belongings and placing them in a bag, of discovering identity cards, which are commonly lacking (the general use of identity disks is much to be desired), and of searching for physical marks or other evidences which may assist what is sometimes a very difficult task of recognition. At one teaching hospital student volunteers have been found to carry out these duties while a kindly and tactful sister and a medical officer of junior staff rank interview relatives. The usual mortuary assistant should report as early as possible on the morning after the raid to arrange the bodies which have received initial attention during the night, to assure the cleanliness of the viewing room, and to give other assistance pending removal of the bodies to the public mortuary or elsewhere. A proper liaison should be established with the local authority to ensure the removal of bodies to the public mortuary within twenty-four hours. Trestles and a supply of old stretchers should be kept in the mortuary in order to free the standard stretchers for cleansing and further use in the hospital. When permission can be obtained, it is of real importance for the advancement of knowledge to carry out post-mortem examinations in certain types of injury. Up to date various difficulties and delays have tended to thwart such inquiries.

Evacuation

When casualties have been numerous during the night as complete an evacuation as possible will be necessary on the morrow to clear the wards for further admissions. The medical officer in charge will have obtained directions from his Hospital or Group Officer as to the destinations of casualties, including those requiring transfer to special centres. A house-physician or other house officer who has not been actively engaged during the night should superintend the loading of ambulances and hand over the lists and notes to the nurses allocated by the matron to accompany them. It will rarely be possible to start the evacuation before 2 p.m., by which time the night surgical and other staff should have retired to rest. One of the most difficult things to cater for is the filling in of the E.M.S. forms and the duplication of the fuller and permanent clinical notes for retention by the hospital and transfer to the " base " respectively. For the comfort of the more serious cases in transit to the " base " many layers of blankets are necessary to serve as mattresses. Where money or gifts are forthcoming there can be no better benefaction than a set of one dozen " sorbo " mattresses with washable covers to fit the standard metal stretchers. These must be checked and sent back with the ambulance conveying nurses and equipment on the return journey.

Reliefs

Relief surgical teams, when not available from a visiting staff, should come from peripheral hospitals. They should work to a rota. After a raid the teams " on call " should communicate with or be warned by the Hospital or Group Officer. If, however, all communications have broken down they should proceed to the hospital which they serve without instructions. The night teams should stop working as soon as possible after 8 a.m. and the reliefs be ready for action by 10 a.m. When arrangements for the diversion of ambulances have been satisfactory it has been rare for the admissions to one hospital to be so numerous that the necessary theatre work could not be finished by midday or early afternoon following a night raid.

As the honorary staff in the case of the voluntary hospitals have many other calls upon their time a rota should be arranged for night duties by the surgeons, physicians, and anaesthetists or others available. At least one surgeon, one physician, and one anaesthetist should be on duty in the hospital during a raid. This is necessary, since it is unfair, when they live at a distance, to summon them during the raid. Furthermore, communications may break down and the approaches to the hospital become difficult. When, however, they live close to the hospital it should be reasonable for them to regard an alert as the indication to go on duty. No large city hospital in a danger zone and lacking a medical superintendent should be without the services of one member at least of the senior staff during the night hours.

Discipline and Other Matters

Practices and lectures should be arranged at intervals for stretcher-bearers, the decontamination and gas treatment units (male and female), and fire-watchers. In the long winter evenings a weekly lecture on general topics, concerts, and debates

make a useful contribution to the maintenance of a good morale and good feeling, and serve to bring together as one family the workers in the many departments, which otherwise carry on from day to day almost in ignorance of each other's functions. Pride in the institution as a unit and in its efficiency is as important for the successful working of a civilian war hospital as it is for a battalion in the field. The medical superintendent and hospital engineer must ensure that there are sufficient sandbags and buckets at all strategic points and that hoses are in order and extinguishers are regularly inspected.

A canteen, running all night and preferably situated close to the receiving room, plays an important part during a raid as a place of meeting and for physical and mental refreshment for internal staff, roof watchers, stretcher-bearers, ambulance drivers, and sometimes for police or firemen working in or near the hospital. If operating has started in the earlier part of the night the whole theatre staff should have at least half an hour off for refreshment between midnight and 3 a.m. It may be necessary for the Medical Officer in Charge to insist on this when the list is long and the surgeons are eager and insufficiently alive to the effects of "industrial fatigue."

In spite of frequent damage by bombs or fire the majority of the large hospitals in London and the other cities affected have thus far been able to carry on their work as casualty clearing stations without serious interruption to their essential work. Certain lessons have, however, been learned. The windows of all important offices and services should be bricked up; these should include the night operating theatres, receiving room, resuscitation ward, and connecting passages. The blasting of windows, apart from the dangers of broken glass, immediately cripples or altogether prevents work owing to the claims of the black-out and the ingress of cold air in winter-time. The theatre in use by night should not be above the ground floor, and wherever possible the same rule should apply to the resuscitation and other casualty wards. Reserve water supplies and lighting should be provided for, and, since gas is especially liable to fail, reserve heating in the form of primus or oil stoves is also necessary. All the alternative routes of exit from wards and the hospital should be in good order and carefully studied by the Medical Officer in Charge and should be known to sisters, house officers, and stretcher-bearers. Plans of evacuation from each occupied ward should be arranged and practised.

Correspondence

Chronic Sick

SIR,—The problem of caring for the "chronic sick" during this war is both a real and an urgent one, and all who have the welfare of sick people at heart must feel compassion for these unfortunates. The solution of the problem is, however, not made any easier by suggestions that the Ministry of Health has not made any attempt to solve it, and that the fact of its existence shows a lack of humanitarianism. A short survey of the position as it affects the Midlands may explain some of the difficulties of the present situation and show that attempts have in fact been made to cope with them.

The number of chronic sick requiring hospital attention in large industrial areas which have been bombed has increased, and is likely still further to increase, because: (1) the destruction of houses has reduced the accommodation available for the chronic sick in their own homes; (2) patients have had to be admitted to hospital because the increased demand for female labour has removed those who would have cared for them in their own homes; (3) the lack of shelter accommodation at the home of the sick person. For these reasons patients who normally would be sent home for convalescence have to stay in hospital; furthermore, the hospital treating these chronic sick may itself have to be evacuated because it has suffered damage or because it is situated in a target area. This problem, therefore, is already an urgent one in some large towns in this area, but it has been made even more acute by the reception of considerable numbers of chronic sick from London and other areas. Sir Frederick Menzies, in his last letter (July 5, p. 31), states that the number of chronic sick in London is 5,000. I do not know the actual number of chronic sick in London when evacuation started, but judging from the number received in this region, and knowing that certain other regions shared our experience, it seems probable that the greater proportion of London's chronic sick have already been evacuated.

A recent letter in the *Journal* by "De Senectute" (June 28, p. 987) suggested that these patients should be accommodated in rural areas and in those country houses which have been taken over by the British Red Cross, but that they must not be sent to "institutions where the stigma of 'workhouse' still prevails," which, I presume, means the Public Assistance Institutions. The only hospitals situated in quiet rural areas are: voluntary hospitals in small towns which for this purpose can be regarded as rural areas; Public Assistance Institutions; "upgraded" Public Assistance Institutions, with or without additional huts; mental hospitals taken over by the E.M.S.; the auxiliary hospitals of the Joint War Organization of the British Red Cross and Order of St. John of Jerusalem. The small towns are in many instances reception areas, and the strain on their hospital beds has been increased by the presence of official and voluntary evacuees. For instance, one such town which has a peacetime population of 40,000—estimated now to have increased to 70,000—is served by a Public Assistance Institution and a voluntary hospital. In normal times the hospital accommodation can perhaps be regarded as adequate, but to-day, owing to the increase in population, an influx of chronic sick, and of patients from casualty clearing hospitals in other towns, there are only twenty-six empty beds in the two hospitals. While it is true that the voluntary hospital could, by erecting beds in corridors, etc., increase this number by sixty-four, it is clear that there is not even an adequate reserve for calls which may come from the town itself, and that it is quite impossible to accept further chronic sick from London or other large industrial towns.

I gather that "De Senectute" would not allow the chronic sick from large towns to be treated in Public Assistance Institutions, which, however, treat the chronic sick from their own districts, and therefore should surely be able to treat those from other districts. It is true that some of the smaller and older of these institutions leave much to be desired, but many of those which have been "upgraded" are first class in every way, and will bear comparison with voluntary hospitals. Indeed, except for those special facilities for investigation which are usually found only in teaching hospitals, it would be difficult to improve upon them. These, with a few mental hospitals which have been taken over by the E.M.S., are the only general hospitals to be found in truly rural districts. It is true that the auxiliary hospitals have never been used to anything like capacity, many indeed having only a few beds occupied and a staff which is intensely bored and discouraged by a long wait for patients. The Joint War Organization does not, however, allow them to be used for chronic sick, and, as a matter of fact, if in this region every bed were occupied by a "chronic sick" patient it would be impossible to accommodate in them all the chronic sick who have been received into the region. In my opinion the Organization would still further help the medical services of this country if they would relax their regulations, but they can plead at least three good reasons why they should not do so:

(1) Auxiliary hospitals are only equipped to deal with convalescent patients whose lengths of stay, without reference back to the parent hospital, is limited to three weeks.

(2) These hospitals are by way of an insurance providing a reserve of beds into which Service patients and civilian casualties can be emptied if a large number of casualties have suddenly to be catered for.

(3) There is a small minority of chronic sick whose behaviour is reprehensible.

Another difficulty in the present situation is that in many instances the chronic sick are occupying beds provided for acute and Service sick and air-raid casualties. As a result there may be inadequate accommodation for those whose immediate need may be even greater than that of the chronic sick. According to "De Senectute" humanitarianism demands evacuation of the chronic sick from the large towns, and the "thousands of beds" thus set free would be invaluable for air-raid casualties, but if it is too dangerous to treat chronic sick in large towns, it could

surely be argued that air-raid casualties should also be treated elsewhere. It seems clear, therefore, that further accommodation must be sought for the chronic sick, and I believe that in some districts large houses, etc., have been set apart for this purpose. I have tried to obtain houses in rural areas in the Midlands for this purpose, but so far without success. There is a great opportunity for the philanthropically minded owners of large houses to offer them for this purpose, although a sufficient number may not be available because so many large houses and institutions are earmarked by one of the various Ministries.

The nursing of the chronic sick also presents problems which should be faced. Many members of the C.N.R., Red Cross, and Order of St. John joined these organizations to nurse soldiers and air-raid casualties, and protest loudly at being called upon to nurse chronic sick. They find the work uninteresting, complain bitterly of the behaviour of some of their patients, and some have resigned. Surprise has been expressed that nurses should resign for these reasons, but when it is remembered that many of them are young girls experiencing their first contacts with rather sordid conditions, and that some of the patients, possibly as a result of senile mental changes, use foul language and have been known to throw their dinner at them or on the floor, it is, perhaps, understandable that some feel they cannot face the conditions. In this connexion it should also be remembered that if these patients wilfully disobey instructions they cannot be dealt with as an ordinary voluntary hospital patient and sent home. In more than one instance a disgruntled patient, particularly if he has been evacuated from a distance, has written to his Member of Parliament complaining about the food and treatment he has received, and a question, perhaps couched in indignant terms, has been asked in the House. Machinery is thus set in motion which results in a medical officer of the Ministry of Health having to visit the hospital and inquire into the complaint. In a typical case, which involved 140 miles of motor travel and the greater part of a busy medical officer's day, the report eventually appeared in the daily Press and contained the following sentences: "I spoke to many of the patients, and all expressed themselves satisfied with their treatment. The master and the matron and all the staff have done everything possible to make everybody comfortable. . . . In my opinion this group of sick and infirm patients from London has been treated very efficiently, both medically and otherwise."

It should be stated quite clearly that these displays of bad behaviour and complaints only come from a very small section of the patients, the great majority being extremely grateful for the care taken of them. I cannot say that all complaints are as groundless as the one mentioned above, but I can say that it is only rarely that a complaint is justified; indeed, these patients are looked after in a way which reflects the greatest credit on the nursing, medical, and administrative staff of the local authorities. I would like to bear testimony to the generous way in which the staff of one particular emergency hospital in the northern part of this region has responded to every call made upon them to receive chronic sick from many places in the Midlands and still further afield. I do not believe that this hospital has received a single acute case since it has been an E.M.S. hospital, but it has earned the gratitude of the many chronic sick who have been treated within its precincts and of those who have to administer the Emergency Medical Service in this region.—I am, etc.,

Birmingham, July 7. LEONARD G. PARSONS.

Protecting Eye-shields

SIR,—In the *Journal* of June 14 (p. 914) I read: "Captain Margesson, replying to Mr. Purbrick on June 10, said that at the request of the War Office the question of affording additional protection against eye injuries in the Army had been very carefully examined by an expert committee of the Medical Research Council in the light of evidence provided by this war and the last. Several tests of various kinds of protective devices had been carried out. As a result, the committee had now recommended that *no special vizor in any material was required other than the present anti-gas eye-shield.*" (My italics.) At the Congress of the Ophthalmological Society of the United Kingdom held in April, 1940, over which I had the honour to preside, the Society passed a unanimous resolution stating that in its opinion at least half the injuries to the eyes of our fighting men would be prevented were they wearing the vizor invented by Sir Richard Cruise.

Here we have two conflicting opinions. The Medical Research Council decide that a sheet of cellophane is sufficient to avoid injuries to the eye by flying fragments of steel; the Ophthalmological Society think that a plate of duralumin is necessary. I leave it to the common sense of the readers of this *Journal* to decide between these two opinions. The Cruise vizor was invented during the last war, but the War Office did not adopt it. Every ophthalmic surgeon who treated wounded eyes during the war knows what the result was: hundreds of men were blinded and many more received serious injury. Some at least of these might have been saved by the vizor. Since that time Sir Richard has greatly improved the vizor, and in its present form it affords a very high degree of protection. It consists of a plate of duralumin perforated by small holes. It is fitted to the steel helmet between the steel shell and the interior bandeau. With a tweak of the fingers it springs down, covering the top of the nose and the eyes. My own tests have shown me that wearing it I can read the last row of the test types, 6/3, with ease, and that a myope can see better through the holes than with his naked eye. Tests with a choke-bore shotgun show that the duralumin is hardly dented at twenty yards. Would the cellophane anti-gas eye-shield keep these shot from perforating? The question is ridiculous. However, the War Office have decided that our soldiers are to have no protection for their eyes under conditions when they might use the vizor, so we must leave it at that.

Let us turn to the civil population—the police forces, the fire fighters, A.R.P. men, and the general public who act as fire watchers. These are expected to approach incendiary bombs, many of them explosive, and extinguish them. They are recommended when approaching a fire-bomb to hold a sandbag before their eyes, or to use the lid of a dustbin. Now, to begin with, they do not carry dustbin lids about with them, nor sandbags, but they do wear steel helmets. If these were provided with the Cruise vizor they could snap it down and approach the bomb knowing that their eyes were reasonably safe. The dustbin lid would be perforated by the fragments of the bomb propelled by high explosive, and the sandbag is a heavy semi-solid mass needing two hands to lift it and hold it up. How could one do anything to a bomb when holding up a sandbag with two hands or when holding a dustbin lid unless it were perforated with sight-holes?

Perhaps it may be argued that eye injuries are not common in air raids. I would refer you to the paper published in the *Journal* of June 28 (p. 966) by my colleague at Coventry, Mrs. Dorothy R. Campbell, in which she describes her experiences after the raids on Coventry. During the past two months I have been acting as Regional Ophthalmic Adviser to the Ministry of Health, and it has been my duty to visit Emergency Hospitals in the Midlands and examine eyes injured during these blitzes. I have also seen cases at the Birmingham Eye Hospital and elsewhere. The facts are that after every raid a large number of eyes are injured: some slightly, some seriously; and some are blinded. A considerable number of these injuries have been sustained by attacking fire-bombs which have exploded. Two of my patients were blinded in both eyes from this cause, and both would have been saved by the Cruise vizor.

A well-known chain-store has recognized the necessity for some protection, for they had on sale, and may now have, an eye-shield of steel with a central adjustable crucial peep-hole. This is good, but the opening is too large and the shield cannot be attached to the helmet. In my own village we have a fire-watching corps, and the members ask for the vizor but cannot obtain it. I have heard that certain chief constables have tried to get the Cruise vizor for their men but have not succeeded. What is the objection to this excellent protective device? It cost 3s. 6d., it weighs about two ounces, and is quite perfect for its job. Is there no possibility that those of the public services who want it can be allowed to buy it? Perhaps a chain-store would market it. The fact is there: the public want it, and cannot get it, but must run the risk of blindness. It is a Gilbertian situation. Men are being blinded by bombs; there is a certain protection, it cannot be obtained. Can nothing be done? Must this risk of blindness go on because

an expert committee consider that a bit of cellophane will keep out fragments that will perforate a bit of three-ply at twenty yards?—I am, etc.,

Birmingham, July 8. T. HARRISON BUTLER, F.R.C.S.

*** We published an article by Sir Richard Cruise on his vizor in the *Journal* of May 18, 1940 (p. 825). In an annotation in our issue of June 1, 1940, we stated: "Protective vizors are indeed a greater need now than in the last war. . . . There are thus vital reasons for effective vizors as part of the civil defence outfit no less than that of the combatant."—ED., *B.M.J.*

Staphylococcus aureus in Nasopharyngeal Infections

SIR,—I am gratified at being quoted in your excellent leading article on acute otitis media (July 5, p. 20). With regard to the question "whether *Staphylococcus aureus* attacks the middle ear as a primary nasopharyngeal infection," I believe never. My opinion is based upon making cultures at operation over a period of twelve years by the method mentioned by you. I have not found *Staphylococcus aureus* before the eighth week, except where the technique was faulty, and it might have been picked up from the skin. I believe, therefore, that it must be added to the organisms causing cutaneous infection, which are always secondary to the nasopharyngeal ones after perforation of the drumhead.

If, therefore, all nasopharyngeal infections were got well by the end of eight weeks of the date of perforation, cutaneous (chronic) otitis media would die out in the course of a generation. Chemotherapy will, I believe, help us to approach this ideal. Once chronic disease has resulted it is, in my opinion, an incurable disease except as the result of the processes of Nature at some time in the life of the human being, which, I believe, is between 14 and 18.—I am, etc.,

Guy's Hospital, S.E.1, July 9. T. B. LAYTON.

Dangers of Posterior Pituitary Extract in Labour

SIR,—Your annotation on the dangers of posterior pituitary extract in labour (May 3, p. 675) states: "It is to be noted that in the discussion following the papers no speaker rose to defend it." May I call your attention to the remarks made by Dr. D. P. Murphy of Philadelphia (*J. Amer. med. Ass.*, 1940, p. 1325) on this subject: "The danger which results from the improper use of solution of posterior pituitary is more a problem of dosage than a question of which patient should receive it, and for that reason I think that those who oppose its use have missed the point entirely. Solution of posterior pituitary has a place in the treatment of certain patients in labour, but only when a non-tetanizing dose is employed, and that dose is in the neighborhood of 1-2 minims." Following Dr. Murphy's discussion I remarked: "The introduction of solution of posterior pituitary more than twenty-five years ago as a means of initiating and reinforcing labour pains constitutes a landmark in the development of the science and art of obstetrics."

May I also refer in this respect to the opinion of Dr. Fr. Irving, professor of obstetrics at Harvard, as expressed in his article in the *Amer. J. Obstet. Gynec.* for November, 1940: "We have used solution of posterior pituitary in the first and second stage of labor in about 20,000 cases and have seen no harmful effect, neither in the mother nor in the baby." The magnitude of the subject requires stress on such authoritative statements.—I am, etc.,

Cincinnati, June 15. J. HOFBAUER.

Is the Safe Period Safe?

SIR,—The safety of the safe period is again being questioned (July 5, p. 23). Much wider agreement on its usefulness would result from a knowledge of its limitations. It is applicable to women with regularly recurring menstrual cycles who lead regular or rather uneventful lives, but no reliance can be placed in it: (1) for up to six months after a miscarriage or confinement; (2) immediately after febrile diseases or an accident; (3) after drastic alteration in ordinary routine, such as change of climate or severe exertion; (4) after emotional upsets or long partings. The even tenor of university life has provided numerous and unchallangeable records of the success of the method under ideal conditions.—I am, etc.,

London, W.1, July 7. REYNOLD H. BOYD.

Silicosis without the Crystal Unit of Quartz

SIR,—In a recent paper entitled "Fibrotic Nodules in the Tracheobronchial Lymph Glands of the Mouse Produced by Breathing Precipitated Silica" (*Brit. J. exp. Path.*, 1941, **22**, 76) it was demonstrated that silicotic nodules can be produced by silica precipitated from sodium silicate by nitric acid. Since there was some doubt as to whether or not this precipitated silica was amorphous, a sample of it was sent recently for analysis to the Physics Department of the National Physical Laboratory. I am indebted to the acting superintendent for the following report: "We find that the sample of silica supplied for test with your letter of June 30 does not give an *x*-ray spectrum. The material is, therefore, amorphous and does not possess any characteristic crystalline unit of appreciable definition or size. We regret that the *x*-ray test for quartz in this case is not applicable."

The conclusion from this is that natural crystalline quartz is not essential for the production of the silicotic nodule, since it has been produced also by an amorphous precipitated silica. Previously Drs. Gye and Purdy (ibid., 1922, **3**, 75) found that colloidal silica produces some degree of fibrosis, but so far as I know it did not produce the nodule. It is probable that, when administered appropriately in the correct dose and for a sufficiently prolonged period, colloidal silica would also produce the nodule.—I am, etc.,

London, N.W.3, July 5. J. ARGYLL CAMPBELL.

The National Loaf

SIR,—The Medical Research Council has issued two documents recently in connexion with the above. In the first it was stated that the addition of calcium was necessary because of the unsatisfactory condition of the bones of part of the population. If this disease does not merely exist in imagination, let the authorities produce and exhibit, say, a dozen adults suffering from it at the Royal Society of Medicine. In the second document the addition of calcium is advocated because of war conditions—inadequate milk, etc. Now there is no evidence whatsoever that the population is suffering from calcium deficiency: it can be said definitely that there is no calcium deficiency. Under present conditions we are short of many substances. Why then is the loaf to be "fortified" with this substance only? It will be remembered that originally the scheme was meant as a permanent "reform," based on pre-war conditions. Now it is advocated merely as a war measure, for which not a scintilla of evidence exists that it is necessary. If I can trust my memory, according to a statement of Lord Woolton the milk consumption at present still does not fall below the pre-war level. In any case milk contains as many items of food as vital as calcium. As in any case an adequate supply of this article of diet is necessary for the sake of the many vital items it contains, the requisite calcium will be forthcoming. Moreover, all available evidence points to the fact that calcium is ineffective without vitamin D. Those of us who have experimented with substances such as calcium have become convinced that its action depends to a vital extent on a number of other items contained in the diet. To concentrate on one item and neglect others as vital as this is scientifically unsound—indeed, the whole scheme has all the characteristics of a nostrum. It would be better if the Government were to make it compulsory to swallow calcium in pill form—in this way at least it would be ensured that each individual got the same dose. But under the proposal, since some people eat twenty times more bread than others they would get twenty times more calcium.

It is a sound physiological principle that the consumption of substances in quantities greater than required is not conducive to good health. According to the Medical Research Council there is no evidence that the added calcium can do harm in any type of disease. But surely this is not enough. The authorities must make sure that chalk can effect no injury in any circumstances. They must prove this, for forty million people cannot be used as experimental rabbits. I know the assertion that

added calcium can do no harm in any type of disease is contrary to actual facts. A large amount of work—some of it dating a generation back—has proved conclusively that under certain conditions calcium is injurious to health. Public interest demands that an exhaustive inquiry into the matter should be instituted by a board comprising men familiar with different aspects of the problem—physiologists, physicians, pathologists, biochemists, food experts, pharmacologists. Members of this body ought to have no connexion with the Medical Research Council or the Food Ministry. The inquiry should be open and detailed evidence published. I trust that the Government proposals will not become effective until the pronouncement of such a body becomes available. The British Medical Association would render a public service by instituting such an inquiry under its ægis.—I am, etc.,

Liverpool, July 9. I. HARRIS.

Differential Diagnosis of Contusion of the Brain and Psychoneurosis

SIR,—My excuse for this note is that I had the good fortune to call in the late Wilfred Trotter to see a head injury case. He gave me a private lesson. On my asking him how he diagnosed contusion of the brain, he answered, "Headaches, brought on especially by changes of posture—for example, stooping, sneezing, coughing, etc.—giddiness, mental apathy, mental degeneration, and congestion of the retinal veins." Whereupon I asked him how he came to a decision about congestion of the veins. With a twinkle in his eye he replied, "That comes with experience, and after that you fix your own index."

I regret that, despite this lesson, the mysterious secrets of the retinal veins have not yet been successfully fathomed by me. Finally, I have also had the advantage of seeing a number of head injuries with Dr. W. A. Brend in the last fifteen years.—I am, etc.,

Solva, Pembrokeshire, July 8. J. STEPHEN LEWIS.

Ether Convulsions

SIR,—I have been very much interested in the correspondence on this subject, as I have seen a few cases since the war when I have had to operate in overheated, sandbagged, and steaming theatres, and when the anaesthetic administered has been ether. Three cases were serious and one ended fatally. I agree with Mr. Charles Wells's description (June 21, p. 945) of ether convulsions as being typically expiratory, and I would like to add that, in my experience, the correct procedure is the immediate administration of chloroform. I have always found the convulsions cease almost at once, and the fatal case I mentioned happened when there was no chloroform available. I have had no experience of the use of evipan for this purpose.—I am, etc.,

J. T. RICE EDWARDS.
Newport, Mon., July 7. Surgeon, E.M.S.

Trichlorethylene as Anaesthetic

SIR,—In view of the large number of anaesthetists who have written to the makers for supplies of trichlorethylene following the publication of our paper in the *Journal* of June 21 (p. 924), we feel that a note of warning might not be amiss.

While we are only too glad for as many workers as possible to try out this drug, we must make it quite clear that we cannot accept responsibility for any untoward effects that may occur. As mentioned in the paper, the total number of administrations made so far is much too small for any definite conclusions as to safety, etc., and the individual anaesthetist must accept the responsibility himself.—We are, etc.,

C. F. HADFIELD.
St. Albans, July 10. C. LANGTON HEWER.

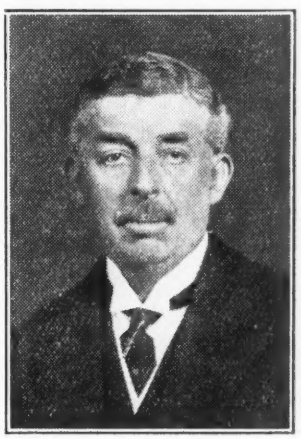
The Middlesex Hospital has received, as a gift from the Scarsdale (New York) Branch of "Bundles for Britain," a mobile *x*-ray set and four portable theatre lights. This new equipment, of the latest design, enables work to be transferred quickly to a basement or sub-basement in the event of an upper theatre being wrecked.

Obituary

SIR WILLIAM H. WILLCOX, K.C.I.E., C.B., C.M.G., M.D., F.R.C.P.

Consulting Physician, St. Mary's Hospital

The death of Sir William Willcox, which took place suddenly and peacefully on July 8 at his home in Welbeck Street, W., where he had carried on a consulting practice for many years, removes from the foremost rank of his profession a highly individual figure. To the man in the street, or in the public galleries of courts, the name of Willcox stood out from the general anonymity of the medical profession owing to his appearance over many years in famous criminal cases. But the same exceptional industry and knowledge which he brought to toxicology in particular and forensic medicine in general he devoted also to the clinical study of disease, and he once declared that to him rheumatic fever or acute rheumatism was the most fascinating subject in the whole of medicine.



William Henry Willcox was a native of Melton Mowbray. Brought up in the heart of a famous hunting country, he never lost his love for the horse and the open—indeed, in late life his horseback exercise cost him a severe accident—and his build and countenance always suggested the robust country squire. He was educated at the Wymondham Grammar School, Oakham, and then at the Wyggeston School, Leicester, and from there he went to University College, London, and to St. Mary's Hospital Medical School. His college career was brilliant. He was gold medallist in anatomy, organic chemistry, materia medica and therapeutics, and forensic medicine, and at St. Mary's he gained the Cheadle gold medal for clinical research. He took his M.B.Lond. in 1900, and proceeded M.D. in the following year, taking also the diploma in public health. From 1904 to 1906 he was medical registrar at St. Mary's, and a year later was elected to the visiting staff of that hospital, so remaining until 1935, when he was made consulting physician. In the war of 1914-18 he served as consultant to the armies in Mesopotamia, and was four times mentioned in dispatches and received the C.B. and C.M.G. There he accumulated fresh clinical experience, especially with regard to malaria, on which he continued to draw for the rest of his life.

His appointment as medical adviser to the Home Office dated from 1919, though he had been associated with the late Prof. Pepper in many criminal cases before then. This brought him into prominence in Crown prosecutions. He was the most deliberate and painstaking expert witness who ever stepped into the box. His hesitating manner at first produced an unfortunate impression, and occasionally even aroused irascibility in a judge who did not know him well. But it soon came to be taken for granted in the legal profession that this slowness of speech was due to conscientiousness and sense of responsibility. The present writer recalls his appearance at the famous Hadwen trial at Gloucester in 1924. When he began his halting testimony one wondered whether at the end of the evidence for the

prosecution the jury might not stop the case, but it gradually dawned on the court that, few as were his words, they each of them, as Morley said of Gladstone's, weighed a pound, and the tilts of Sir Edward Marshall-Hall for the defence made no dent at all in that heavy armour. At about that same time, at a meeting of the Hunterian Society, Willcox gave a description of the duties of a medical witness; it is too long to quote here, but it could not be bettered.

It was the same in his public utterances: he would make a hesitating beginning, and one was inclined to think that he was talking complimentary nothings when there would come a shrewd clinical observation, a description of an unusual case, an exposition of some aspect of pathology, or a warning against a drug fashion of the moment. At the time when the barbiturates came into common use Willcox made up his mind once for all, and never lost an opportunity to warn the profession against their indiscriminate employment. In recommending vaccines, too, he never tired of urging the greatest care lest some condition such as exophthalmic goitre had sensitized the body. Again with anaesthetics, he held that avertin should only be used by the most experienced, and by them with the greatest caution, owing to its liability to cause liver damage. No one was more cautious, painstaking, and exhaustive in what he undertook. His writings are spread over medical journals and the transactions of societies, but even casual communications are marked by thoroughness, and in such a contribution as the Lumleian Lectures to the Royal College of Physicians in 1931 the subject—toxic jaundice—was so fully explored that there seemed to be nothing left to be said. The lecture table was his chosen medium for imparting knowledge. At St. Mary's for thirty years he was lecturer on chemical pathology, and for almost the same period on forensic medicine.

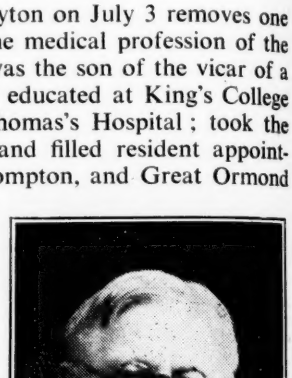
He was a member of the British Medical Association for thirty-five years. In 1932, the year of the Association's Centenary, he was president of the Section of Forensic Medicine, and made a plea for more public recognition of that subject, particularly urging his old University of London to establish a professorial chair. When the Annual Meeting was held at Melbourne in 1935 he was president of the Section of Pharmacology, Therapeutics, and Anaesthetics. On that occasion Melbourne University conferred on him its M.D. *honoris causa*. Ten years ago he was chairman of the Marylebone Division, and he served on a number of special committees at headquarters, notably one on causes and treatment of arthritis, and another on tests for drunkenness. There were few medical societies in London whose chair he had not filled. He was president of the Harveian Society in 1922, of the West London Medico-Chirurgical Society in 1923, of the Medico-Legal Society in 1928, and of the Medical Society of London in 1936, when he delivered a noteworthy presidential address on clinical immunity. During the last two years he had been president of the Section of Therapeutics and Pharmacology of the Royal Society of Medicine. In 1935 he was Master of the Society of Apothecaries, of which he had become a licentiate thirty-six years before. He was elected F.R.C.P. in 1910, and served on the Council of the College in 1931-3. Other offices which he held were those of examiner in pharmacology and therapeutics to the University of Cambridge and visitor for the Privy Council to the examinations of the Pharmaceutical Society. He was senior physician to the London Fever Hospital and to St. Luke's Hostel for the Clergy. The latter benevolent enterprise was very near his heart. He was a man of great kindness and of unlimited private generosity.

The honour of knighthood in the Order of the Indian Empire was bestowed upon him in 1921. He married a Northamptonshire lady, who survives him with three sons and a daughter.

[The photograph reproduced is by J. Russell and Sons.]

F. G. LAYTON, M.R.C.S.

The sudden death of F. G. Layton on July 3 removes one of the best-known figures in the medical profession of the Midlands. Born in 1872, he was the son of the vicar of a South London parish; he was educated at King's College School, London, and at St. Thomas's Hospital; took the M.R.C.S., L.R.C.P. in 1894; and filled resident appointments at his own hospital, Brompton, and Great Ormond Street. Settling at Walsall, he identified himself with the Walsall General Hospital, to which, at the time of his death, he was consulting physician. He took a prominent part in local public life and was a Justice of the Peace, an office in which he took a special interest, as is shown by his book *Psychology in Court*. He had a very prolific pen, and wrote several books dealing in a light but sympathetic vein with the life of a general practitioner among poor folk. These included *The Little Doctor* and *Behind the Night Bell*. He also for many years edited the *Midland Medical Journal*. He joined the British Medical Association in 1895, and took an active part in its local work. From 1913 to 1922 he was honorary secretary of the Walsall and Lichfield Division. In 1935-6 he was chairman of the Division, and at the time of his death was president of the Staffordshire Branch.



Dr. ALFRED COX writes:

The death of Layton brings back many recollections of happier times when he was not only the life and soul of B.M.A. activities in his Division but a most watchful and constant critic of our activities at headquarters. He was essentially an individualist, but combined with his individualism a strong sense of his duty to the community and a real love and understanding of the "under-dog." This he showed both in his life and in his books, which could only have been written by a real "family doctor" whose sense of his responsibilities to his patients was equalled by his sense of humour. With Layton the style was essentially the man both in writing and conversation.

In the early days of the new constitution Walsall was not an easy district from the B.M.A. point of view, and had it not been for Layton its record would have been much less honourable than it is. He used his pen and his tongue on his colleagues just as he did on us at the office; but all of us took his jibes and criticisms more or less meekly just because they came from Layton and because we knew his bark was worse than his bite. He had a horror of "bureaucracy," and used to chaff me unmercifully (in letters which were always a joy to receive and to answer) about the style of our official communications. More than once he sent me a free translation of such documents as they should have been written (in Laytonese) and as a model to which we ought to aspire.

His long B.M.A. record deserves handsome recognition, for the labours of such men as he have made the path of their successors so much easier. But those of us who knew him well and loved him will always think of Layton the man—honest, direct, and always arriving like a breeze of fresh air whenever he appeared on the scene either personally or in writing.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

The following candidates have been approved at the examination indicated:

FINAL M.B.—*Part I (Surgery, Midwifery, and Gynaecology):* R. M. Archer, J. D. Attwell, R. C. Barclay, D. V. Bateman, K. F. C. Brown, L. J. H. Burton, H. Butler, W. H. Chase, R. E. W. B. Comerford, E. D. Cullen, P. M. Daniel, B. Dansie, F. M. P. Eckstein, E. J. S. Evans, C. L. Grandage, R. E. A. S. Hansen, D. V. Harris, A. Holmes-Smith, E. B. Jarrett, R. Jenkins, J. S. Johnstone, K. H. Lim, L. R. McLaren, H. L. McMullen, J. M. Mungavin, P. H. Nash, T. P. Pattinson, A. G. E. Pearse, G. E. Pinkerton, G. K. Riddoch, P. Sainsbury, J. L. S. Smith, A. G. Stansfeld, J. H. Tasker, H. D. Teare, D. E. Thompson, D. G. Vulliamy, A. Waymouth, H. G. Wolskel. *Women:* H. M. Comely, A. Davies, D. H. King, M. Redfern Davies.

DIPLOMA IN MEDICAL RADIOLOGY AND ELECTROLOGY.—*Part II:* M. Altmann, R. D. Caton, A. Elkeles, J. E. Glasgow, Mrs. Grace M. Griffith, M. Halberstaedter, P. C. Phelps.

UNIVERSITY OF ABERDEEN

At a graduation ceremony on July 10 the honorary degree of LL.D. was conferred on Dr. Arthur Wellesley Falconer, C.B.E., D.S.O., M.D., F.R.C.P., Principal and Vice-Chancellor of the University of Capetown (*in absentia*).

The following medical degrees and diplomas were also conferred:

M.B., CH.B.—*G. E. Swinney, *A. R. Taylor, T. M. Allan, A. L. S. Anderson, Marie L. Anderson, J. B. Barnet, W. H. F. Boyd, A. A. Brockie, B. E. Brocks, J. L. D. Brown, J. Bruce, N. B. Carmichael, Alison Clarke, A. M. W. Coburn, H. D. Collins, J. Cramond, J. Cran, Eunice M. Duncan-Brown (*née* Auty), A. H. Dunnett, Marguerite N. L. Erskine, J. W. Gammie, A. G. Gibb, R. A. S. Gibb, Vera W. D. Hall, Helen D. Harkins, J. A. Harrow, G. A. M. Hendry, M. I. Hepburn, T. Hunter, F. L. F. Innes, J. M. E. Jewers, P. O. Leggat, J. J. McNair, J. G. Matheson, R. F. Menzies, P. Milne, W. H. P. Minto, R. G. Murray, K. O'Brien, J. Slater, A. Stephen, Florence Stewart, W. D. Swinney, P. Theron, E. J. Valentine, S. W. Watson, R. A. S. Watt, Lily White, Margaret O. Will, D. MacG. Williamson, L. A. Wilson, A. J. Witt, J. F. Woolcott.

DIPLOMA IN PUBLIC HEALTH.—W. Lamb, J. A. F. McLean.

* Second-class honours.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

Message from the King

The following letter from the King's Private Secretary has been received by the Royal College of Surgeons of England and was read to the Council at a meeting held on July 10:

Dear Sir Hugh Lett,

I write to thank you for your letter of yesterday, which I have laid before the King as Visitor to the Royal College of Surgeons of England. I am to assure you that it is a source of deep regret to His Majesty to learn of the damage to the Museum buildings and the loss of valuable specimens resulting from enemy action. The King is, however, much gratified to hear of the further generous gift made by the Bernhard Baron Trustees towards the endowment of the professorship of research which will go far to prevent any of the regrettable interruption which might otherwise have occurred in the scientific work and development of the College.

Yours very truly,
(Signed) A. H. L. HARDINGE.

Election of President

At a meeting of the Council of the Royal College of Surgeons of England, held on July 10, with Sir Hugh Lett, President, in the chair, Sir Alfred Webb-Johnson was elected President for the ensuing year, and Surgeon Rear-Admiral G. Gordon-Taylor and Mr. L. R. Braithwaite were elected Vice-Presidents. Prof. A. H. Burgess, Mr. H. S. Souttar, and Mr. V. Zachary Cope were readmitted, and Mr. E. Finch was admitted to the Council.

Lecturers

The following professors, lecturers, and demonstrators were elected for the ensuing year:

Hunterian Professors.—Surgeon Rear-Admiral G. Gordon-Taylor, one lecture on the Surgical Anatomy of the Lower End of the Common Bile Duct and the Adjacent Head of the Pancreas; Surgeon Rear-Admiral C. P. G. Wakeley, one lecture on War Burns; Lieut.-Colonel A. E. Hamerton, one lecture on Primary Degeneration of the Spinal Cord in Monkeys; Mr. W. T. Warwick, two lectures on Observations on the Growth of Long Bones; Prof. F. Davies, one lecture on the Conducting System of the Vertebrate Heart; Mr. N. Asherson, one lecture on the Otogenic Cerebellar Abscess, with Special Reference to its Operative Treatment and the Posterior Fossa Cerebrospinal Fluid Syndrome; Surgeon Commander E. R. P. Williams, one lecture on Blast Injuries in Warfare; Mr. A. Sorsby, one lecture on Aetiology of Phlyctenular Ophthalmia; Mr. J. T. Chesterman, one lecture on Evaluation and Treatment of Factors involved in Post-lobectomy Collapse of the Lung; Mr. F. W. Willway, one lecture on the Role of Surgery in Mental Disease; Mr. D. N. Matthews, one lecture to Investigate the Value of Sulphanilamide and Sulphathiazole applied locally to Infected Wounds and Burns.

Arris and Gale Lectures.—Prof. J. Beattie, two lectures on Physical and Chemical Changes in the Blood associated with Shock and Haemorrhage; Dr. D. P. Cuthbertson, one lecture on Certain Aspects of the Physiological Reaction to Injury—the Post-shock Metabolic Response.

Erasmus Wilson Demonstrators.—Mr. L. E. C. Norbury, two demonstrations on the pathological contents of the Museum; Mr. R. Davies-Colley, two demonstrations; Mr. C. E. Shattock, two demonstrations.

Arnott Demonstrator.—Mr. A. J. E. Cave, six demonstrations on the contents of the Museum.

Appointments

Sir Frank Colyer, Honorary Curator of the Odontological Collection, and Mr. C. J. S. Thompson, Honorary Curator of the Historical Collection, were reappointed for the ensuing year.

The Hallett Prize, granted on the result of the Primary Examination for the Fellowship, was awarded to S. Oleesky of the University of Manchester; the twelfth Macloghlin Scholarship was awarded to D. L. Kerr of Whitgift School, Croydon; and a Leverhulme Scholarship was granted to Miss H. B. Collard for a year beginning August 1, 1941. Subject of research: Study of the change in blood volume following haemorrhage.

Diplomas

Diplomas were granted, jointly with the Royal College of Physicians of London, as follows:

DIPLOMA IN PUBLIC HEALTH.—C. A. Boucher, M. Coke, Nancie I. Faux, H. J. Griffiths, W. E. MacDougall, H. C. Price.

DIPLOMA IN PSYCHOLOGICAL MEDICINE.—R. A. Blair, Edith M. Booth, E. W. Dunkley, A. M. Edwards, S. T. Hayward J. J. H. Lowe, J. S. McGregor, Sigrid M. Pribram, W. A. M. Robinson, J. S. F. Sutton, Mary E. E. Ward.

DIPLOMA IN LARYNGOLOGY AND OTOLOGY.—D. A. Barley, N. Ll. Crabtree, O. C. Lord, J. E. Rees.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW

At a meeting of the Royal Faculty of Physicians and Surgeons of Glasgow, held on July 7, with Mr. Roy F. Young, President, in the chair, A. McPhater, M.B., Ch.B., and H. H. Pinkerton, M.B., Ch.B., D.A., were admitted Fellows of Faculty.

The Services

ARMY AWARDS

The following honours have been conferred in recognition of distinguished services in the Middle East during the period December, 1940, to February, 1941:

C.B. (*Military Division*): Colonel (Temporary Major-General) P. S. Tomlinson, D.S.O., late R.A.M.C.

C.B.E. (*Military Division*): Lieutenant-Colonel (Temporary Colonel) F. G. A. Smyth, O.B.E., R.A.M.C.

O.B.E. (*Military Division*): Major (Temporary Lieut.-Colonel) B. J. Daunt, R.A.M.C.

M.B.E. (*Military Division*): Captain (Temporary Major) P. L. E. Wood, R.A.M.C.

MENTIONS IN DISPATCHES

The following have been mentioned in dispatches for distinguished services in the Middle East during the period December, 1940, to February, 1941.

Army Medical Corps: Lieut.-Colonels A. J. Cunningham (since deceased), H. G. Furnell, D.S.O., and L. E. Le Soeuf; Majors E. Bailhache (since deceased) and J. O. Smith; and Captains L. V. Armati, K. J. J. Dorney, N. R. Godby, and R. H. MacDonald.

Royal Army Medical Corps: Major (Temporary Lieut.-Colonel) D. Bluett; Captains (Temporary Majors) D. R. Hood, R. B. Robertson, and R. A. Stephen; and Captains W. J. A. Craig, T. G. S. James, J. J. Justice, R. H. Spurrier, and M. H. Webster.

Indian Medical Service: Lieut.-Colonel A. N. Sharma; Captain (Temporary Major) J. Revans; and Captains D. R. Cattanach, R. Y. Taylor, and D. D. Verma.

New Zealand Army Medical Corps: Captain A. L. Lomas, M.C.

Temporary Surgeon Lieut. John Fawcett Hughes, R.N.V.R., has been mentioned in dispatches for good services when H.M.S. *Exmoor* was sunk.

CASUALTIES IN THE MEDICAL SERVICES

ROYAL NAVY

The name of Surgeon Lieut. DUNCAN LORIMER, R.N.V.R., is included in an Admiralty casualty list published on July 9 as "Missing, Presumed Killed" in H.M.S. *Jersey*. After graduating B.A. at the University of Cambridge in 1935 he studied medicine at the University of Edinburgh, where he took the degrees of M.B., Ch.B. in 1938. He was a member of the British Medical Association and of the Royal Medical Society of Edinburgh.

Surgeon Commander ARCHIBALD ROBERT EWART, R.N., lost his life by enemy action at sea in June. He was the eldest son of the late Mr. Thomas Ewart and Mrs. Ewart of Limerick, and was educated at the University of Dublin, where he graduated M.B., B.Ch., B.A.O. in 1928. Soon afterwards he entered the Royal Navy as surgeon lieutenant, was promoted to surgeon lieutenant-commander in 1934, and to surgeon commander last year. He had been a member of the British Medical Association since 1929.

Surgeon Lieutenant ARCHIBALD THOMAS LEGGATE has been killed by enemy action while on active service. He was last seen attending the wounded on the deck of his vessel and went down with the ship. Dr. Leggate, who was 30 years of age, was the third son of Dr. and Mrs. Leggate of Liverpool, and his wife, whom he married recently, was formerly Dr. Joan Thomson. He had a distinguished scholastic career. At Liverpool College, where he was a member of the First rugby and cricket teams, he was awarded many prizes and won a scholarship to Emmanuel College, Cambridge. At that stage his main interests were philosophy and history, and he seemed destined for the Church. The family tradition of medicine, however, proved too strong, and after graduating at Cambridge he entered Liverpool University and qualified M.B., Ch.B. (with distinction in surgery) in 1937. Following a period as house-physician at Liverpool Royal Infirmary, he helped in his father's practice, and rapidly became a most conscientious and resourceful practitioner, combining dignity and knowledge with good humour and understanding. It was doubtful whether he intended to stay in general practice, and specialization in psychiatry greatly attracted him. Archie Leggate (writes a colleague) had an exceptionally wide range of interests—music, history, and literature—and amongst his major delights he always counted the wild grandeur of the North-West Highlands. Transcending all was his love of humanity; he had tremendous faith in man and in the ultimate triumph of truth and goodness. Essentially a man of peace, he became imbued with the courageous spirit of a Crusader, and with conviction based on the highest Christian ideals he joined the R.N.V.R. at the outset of the war.

In an Admiralty casualty list published on July 9 Probationary Temporary Surgeon Lieut. ALAN KENNETH BEARDSHAW, R.N.V.R., is posted as "Missing, Presumed Killed" in H.M. Yacht *Fiona*. He was educated at the University of Sheffield, where he graduated M.B., Ch.B. in 1938. He was a member of the British Medical Association.

ROYAL AIR FORCE

Acting Squadron Leader DAVID ALAN HOPE ROBSON was killed in June. He was born on July 11, 1908, and received his medical education at the University of Edinburgh, graduating M.B., Ch.B. in 1933. After holding house appointments at the Children's Hospital and City General Hospital, Sheffield, he spent four years in general practice at Beddington, Surrey, and became honorary medical officer to the Carshalton and Beddington War Memorial Hospital. He entered the Medical Branch of the Royal Air Force on a short service commission, and served in France from September, 1939, until April, 1940, when he was posted to an operational unit. Acting Squadron Leader Robson was keenly interested in flying, and qualified as a pilot in February, 1941.

Flight Lieut. DENIS WILLIAM MAHON was seriously injured in June, and died shortly afterwards. He was born on February 19, 1915, and received his medical education at the London Hospital, qualifying M.R.C.S., L.R.C.P. in 1938. He was a member of the O.T.C. After holding the post of demonstrator in applied physiology, histology, and applied pharmacology at the London Hospital Medical College and house appointments at Poplar Hospital, and the Royal Berkshire Hospital, Reading, he was commissioned in the R.A.F.V.R. on November 28, 1939. From February till June, 1940, he served in France, and since then had been medical officer to a bomber squadron.

Medical Notes in Parliament

The National Health Insurance, Contributory Pensions, and Workmen's Compensation Bill was introduced by Mr. ERNEST BROWN on July 1 and was read a first time. Its purposes are "to increase the rates of sickness and disablement benefit and the rates of contribution payable under the Acts relating to National Health Insurance, to extend the said Acts to persons employed otherwise than by way of manual labour at a rate of remuneration exceeding £250 a year," and also to make changes in the Acts relating to Pensions and Workmen's Compensation. The text of the Bill is published.

Speaking in a debate on production on July 9, Mr. HAROLD MACMILLAN said the Ministry of Supply was buying medical and surgical supplies for the Air Force.

Research into Gas Decontamination of the Eyes

Mr. HAROLD MACMILLAN, replying on July 8 to Mr. Groves, said research on the medical treatment of gas casualties had been carried out in the Chemical Defence Research Department and elsewhere by teams of fully qualified men, with the personal assistance and supervision of well-known research workers in the physiological and pharmacological fields. The findings of these workers had been scrutinized by a medical committee consisting of distinguished civilian specialists and Service medical men, to which additional specialists had been co-opted. Increasing pressure of work on eye treatment was found in the summer of 1940 to necessitate the whole-time employment of an ophthalmological specialist, but owing to the difficulty of obtaining a suitably qualified man this appointment was not made till August, 1940. It was then also found possible to engage the assistance in addition of leading ophthalmologists, working in independent laboratories. The intensive research which thereby became possible included re-examination of all methods tried previously.

Fracture and Orthopaedic Treatment in Scotland

On July 8 Mr. JOHNSTON, replying to Dr. Morgan, said that while he was aware that facilities for fracture treatment in Edinburgh and Glasgow were not generally in full accordance with the recommendations of the Delevingne Committee, some progress had been made since the publication of the report. Moreover, in developing the Emergency Hospital Services special attention had been given to arrangements for the treatment of fractures, including the provision in Scotland of six entirely new orthopaedic units (with associated provision for occupational therapy providing 2,000 beds). As announced by the Minister of Health on April 3, these facilities were available not only for the treatment of civilian war casualties but for certain manual workers whose early return to work was of special importance. As regards conditions which occasioned crippling other than fractures, he had encouraged schemes initiated by voluntary bodies for the improvement and extension of facilities for their treatment. He was not aware of any official report on this subject other than that of the Delevingne Committee.

Care of Wounded in Invasion

On July 8 Mr. GROVES asked the Minister of Health if he would state the arrangements made by the A.R.P. for the care of wounded civilians in the event of invasion making road or telephone communication impossible over large areas, particularly in those coastal regions upon which the brunt of invasion might be expected to fall. Mr. BROWN said that the arrangements made to meet the contingency described could not in the national interest be set out in detail, but his Regional Officers and the scheme-making authorities had been fully alive to it when reviewing the first-aid posts, first-aid points, and ambulance services in their areas.

Children's Health in Camps.—Mr. JOHNSTON stated on June 25 that quarterly reports submitted by the camp medical officers showed residence at the camps provided in Scotland under the Camps Act, 1939, had a markedly beneficial effect on the health and physical condition of the children. Most gained in height and weight and had shown an increased resistance to infection. When Belmont Camp was reopened those children who returned were found to have lost in weight during their absence of three months.

Wartime Nurseries: Medical Supervision.—Mr. GROVES, having regard to the additional duties imposed upon medical officers of health by reason of the war, asked whether arrangements had been made or recommended for the services of available local general practitioners to be utilized for the regular medical inspection and supervision of the children at wartime nurseries. Mr. BROWN told Mr. Groves on June 24 that detailed arrangements for the medical supervision of children in wartime nurseries were a matter for the medical officer of health of the welfare authority establishing the nursery. Such arrangements would usually take the form of an extension of the authority's existing scheme for the medical supervision of young children, whether by whole- or part-time medical officers.

Notes in Brief

Mr. E. Brown told Mr. Viant on June 17 that of the 15 cases of post-vaccinal encephalitis which came to the notice of his Department in 1940, 5 were fatal. Two of the fatal cases were in soldiers. The others had recovered.

EPIDEMIOLOGICAL NOTES

Infectious Diseases for the Week

In England and Wales the incidence of enteric fever and cerebrospinal fever has declined slightly, and both diseases are now less prevalent than at this period last year. Dysentery and whooping-cough are on the increase and are respectively over twice and six times more prevalent than last year. The incidence of diphtheria has also shown a tendency to rise in the last two weeks. The persistent high incidence in Birmingham, where the same number—31—was notified in each of the last three weeks, and the virulent type of the prevalent infection, have been causing concern to the public health authorities. In the first six months of this year there were in Birmingham 600 confirmed cases of diphtheria compared with 336 last year, and 56 deaths compared with 16. Although facilities for immunization are ample and much advertised, it appears that less than one-half of the child population have been inoculated. In Scotland notifications of cerebrospinal fever have risen from 42 to 50; the principal notifiable diseases are less prevalent than in 1940, with the exception of whooping-cough and enteric fever.

Enteric Fever and Dysentery

Enteric fever is present in twenty-seven areas in England and Wales, compared with twenty-six in the previous week, but only in three were more than 10 cases notified—namely, Lancaster 45 (Blackpool 1, Bootle 9, Liverpool 26, Bacup M.B. 1, Eccles M.B. 1, Kirkham U.D. 1, Litherland U.D. 1, Urmston U.D. 1, West Lancashire U.D. 1, Widnes M.B. 3); Warwick 13 (Birmingham 7, Nuneaton M.B. 3, Solihull U.D. 2, Sutton Coldfield M.B. 1); Chester 11 (Birkenhead 7, Wallasey 3, Bebington M.B. 1). Although only slightly less prevalent than enteric fever, dysentery appeared in no more than sixteen areas, and in two only were there more than 10 cases—namely, Brecknock 40 (all in Brecknock M.B.) and Lancaster 27 (Blackburn C.B. 4, R.D. 13, Liverpool 2, Preston R.D. 1, Warrington R.D. 4, Whiston R.D. 3). In Scotland there were 4 cases of typhoid fever (Greenock 2, Motherwell and Wishaw 2), and 15 of paratyphoid B fever (9 in Dundee, and 1 each in the counties of Angus, Ayr, and Roxburgh, and in the burghs of Kirkcaldy, Glasgow, and Edinburgh). Dysentery was more prevalent, affecting the counties of Argyll 1, Lanark 5, Renfrew 1, Stirling 1, and the burghs of Aberdeen 9, Dundee 1, Glasgow 6, and Edinburgh 3.

Whooping-cough

Whooping-cough is present in every administrative area in England, and in one (Rutland 7) was the only disease notified during the week. Only the three Welsh counties of Anglesey, Cardigan, and Montgomery were free. Areas chiefly involved were Lancaster 519, West Riding of Yorks 443, Middlesex 334, Durham 330, Surrey 301, Essex 222, Derby 164, London 160, Kent 143, Warwick 143, Stafford 135, Northumberland 102, Northampton 101. In Scotland notifications were received from the county of Lanark 13, and the burghs of Glasgow 174, Edinburgh 40, Paisley 8, Dundee 8, Greenock 7, Rutherglen 7, Kirkcaldy 4, Aberdeen and Dunfermline 1 each, but this disease is notifiable only in particular areas when it is prevalent or a method of "intimation" is employed.

No. 25

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended June 21.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1941					1940 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	211	13	50	5	14	264	23	68	2	7
Deaths		2	1				2	3		
Diphtheria	919	36	184	29	21	735	30	193	23	31
Deaths	24	—	6	2	2	22	1	8	2	1
Dysentery	113	9	27	—	—	51	2	29	—	—
Deaths				—	—			—	—	—
Encephalitis lethargica, acute	6	1	—	—	—	3	—	1	1	—
Deaths		2	—				1	3		
Enteric (typhoid and paratyphoid) fever	127	1	19	4	—	205	16	1	6	2
Deaths	2	—	—	—	—	2	1	—	—	—
Erysipelas		—	39	8	3		17	37	6	3
Deaths		—	—				—	—		
Infective enteritis or diarrhoea under 2 years										
Deaths	32	1	10	9	2	25	3	8	5	5
Measles	8,958	293	107		10	9,366	30	1,957		27
Deaths	10	—	1	8	—	4	—	12	2	—
Ophthalmia neonatorum	75	1	8	1	1	81	6	23	—	1
Deaths										
Pneumonia, influenzal*	668	22	14	2	1	444	17	6	1	2
Deaths (from influenza)	6	21	2	—	9	12	1	—	1	1
Pneumonia, primary			206	11				163	5	
Deaths		—		10	—		21		7	6
Polio-encephalitis, acute	—	—				4	—			
Deaths		—					—			
Poliomyelitis, acute	9	—	1	—	—	24	—	—	—	—
Deaths		—	—				—	—		
Puerperal fever	1	1	10	3	1	3	3	11	4	—
Deaths		—					—			
Puerperal pyrexia	115	2	9		4	124	18	18		—
Deaths										
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	955	36	124	75	13	884	32	116	48	68
Deaths	—	—	—	—	—	—	—	—	—	—
Small-pox	—	—	—		—	—	—	—		—
Deaths	—	—	—	—	—	—	—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	1	—
Deaths			—	—	—			—	—	—
Whooping-cough	4,837	160	263		7	720	3	58		11
Deaths	34	3	4	—	—	3	—	4	1	—
Deaths (0-1 year)	278	16	67	35	17	277	30	65	30	19
Infant mortality rate (per 1,000 live births)										
Deaths (excluding still-births)	4,214	512	626	197	145†	3,983	616	572	210	126
Annual death rate (per 1,000 persons living)			13.6	13.1	—			11.6	14.0	11.0
Live births	4,612	321	881	433	187†	6,296	983	886	418	270
Annual rate per 1,000 persons living			17.9	28.7	—			17.9	29.9	23.7
Stillbirths	213	17	25			220	27	40		
Rate per 1,000 total births (including stillborn)			28					43		

* Includes primary form in figures for England and Wales, London (administrative county), and Northern Ireland.

† Owing to recent movements of population, birth and death rates can no longer be given for Northern Ireland.

Medical News

Papers on "Some Soviet Contributions to War Surgery" will be read by Dr. Janet Vaughan and Mr. Ruscoe Clarke, F.R.C.S., on Friday, July 25, at 7.30 p.m., at the Medical Society of London, 11, Chandos Street, London, W.1. Invitation cards may be obtained from the Society for Cultural Relations with the U.S.S.R., 98, Gower Street, London, W.C.1 (Euston 2315).

Owing to the large numbers of wounded German officers and men arriving back from the Russian front, the German Government has ordered the mobilization of Jewish doctors and nurses in the Third Reich to assist in the care of the wounded. Similar mobilization orders have been issued in Hungary, Rumania, and Slovakia.

The Association of Special Libraries and Information Bureaux (ASLIB) is undertaking a national survey of the present position concerning enemy and enemy-controlled publications, especially the current issues of periodicals. Previous inquiries have confirmed the impression that since the early part of 1940 only very limited supplies have been arriving in this country; that they consist mainly of imperfect sets of a few periodicals restricted very largely to departmental libraries that are not accessible to the general public; and that only a detailed survey can reveal the inadequacy of the present supplies. Through the good offices of the Royal Society, the Rockefeller Foundation has now provided funds for such a survey, which will be completed by a committee of the association by the autumn. A memorandum is being circulated to some two thousand institutions and individuals to ascertain what publications they need and the extent to which they are locally available. Those who do not receive a copy of the memorandum and are interested to do so should communicate with the ASLIB Foreign Periodicals Committee, 31, Museum Street, London, W.1.

A Venezuela Society of Microbiology, Parasitology, and Tropical Medicine has recently been founded at Caracas.

In 1940, 5,715 taxi-drivers in Germany had their licences withdrawn, in 1,672 cases owing to being drunk while driving.

Letters, Notes, and Answers

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.

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TELEPHONE NO.—B.M.A. and *B.M.J.*: EUSTON 2111.

TELEGRAPHIC ADDRESSES: EDITOR, *Aitiology Westcent, London*; SECRETARY, *Medisecra Westcent, London.*

B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

QUERIES AND ANSWERS

Urticaria

"B. M. E." (Middlesex) writes: In reply to "H. S." (June 28, p. 922), a case of severe urticaria some years ago in which drugs were of no avail cleared up after a few doses of an autogenous intestinal vaccine, the organisms found being of the Gaertner group. There has been no return—the case had lasted some months.

Dysmenorrhoea

Dr. A. C. F. HALFORD (Brisbane) writes: I was very interested to read Mr. A. J. Hobson's advice (February 1, p. 182) to use calcium lactate for the relief of dysmenorrhoea. His prescription is the formula of the late Dr. Blair-Bell, mistura calcii lactatis recentis, under which name Mr. Hobson's prescription may be written. I have used this preparation for many years, and have always regarded calcium as a very useful drug for many conditions described in its pharmacology, notably in that valuable publication the *Extra Pharmacopoeia*. It is very effective at all stages of pregnancy, especially during the latter months, to remove oedema, albuminuria, headache, and cramp—pre-eclamptic states, in fact. Liquor calcis lactatis (Martindale) is claimed to be a more stable preparation and so should be remembered. Calcium, combined with tinct. cannabis indica, both in full doses, should be tried out in all cases of menorrhagia before any surgical procedures are undertaken. And so also for dysmenorrhoea hot baths and plenty of exercise should take first place in therapeutics. Proprietary preparations are in no way superior to calcii lactatis recentis, which is much cheaper.

Exercises for Arteriosclerosis

"J. B." writes: I should be grateful for advice in the treatment of the following case. A man aged 77 suffers from arteriosclerosis, chiefly in the right foot and leg, accompanied by some coldness, slight redness, numbness, and loss of sense of light touch in the toes. The pulse in the arteries at the ankle is imperceptible. Other symptoms are: claudication, pain, cramp, weight, and tired feeling in the calf on walking 150 to 200 yards. The kidney and liver are in good condition; blood pressure is 142/90; slight angina pectoris on exertion for seven years. Two years ago I saw it stated that Buerger's exercises were of "definite value." I should be glad to know if these are really useful. They require forty-five minutes thrice daily, and include: (1) raising and blanching the foot; (2) hanging and reddening it; and then (3) placing the limb in a horizontal position for three minutes in each cycle.

LETTERS, NOTES, ETC.

Nurse Anaesthetists

Dr. J. R. J. BEDDARD writes: Having read with great interest the correspondence concerning nurse anaesthetists in the *Journal*, I hope you may find space for a few further remarks by way of postscript. Those surgeons who support the retrograde step taken at Addenbrooke's Hospital do not seem to realize that their own art lends itself to division among trained technicians. Might it not be beneficial to the patient if he were under a physician who could prescribe all treatment, treating the patient as a whole and calling in the technicians when indicated? The day of the "hernia nurse," the "whitlow nurse," and the "haemorrhoidal porter" may yet come! I think the real answer is that a person who is doing one job all the time will always be better than one who does it occasionally, or one who is recently qualified and is exploring vast new territories in the continent of medicine and surgery. In a given case the type of anaesthetic to be employed in the best interests of the patient can only be accurately assessed by the physician-anaesthetist; surgeons are apt to be parochial in this matter. If mere technicians are to be employed in surgery or anaesthesia it is an end to progress, and this branch of medical science will remain stationary.

Coined Medical Words

Dr. W. A. BREND writes: I am grateful to Dr. Sutton for pointing out (July 5, p. 38) that hyperphobesis is preferable to hyperphobosis as a term for "excessive fear reaction." I do not, however, care for φρίκη (shuddering) as an alternative, since hyperphobesis is more likely to be readily understood and memorized by those already familiar with the significance of the prefix "hyper-" and of the word "phobia" in psychiatry.

The Golden Rule in Reception Areas

The National Baby Welfare Council (29, Gordon Square, W.C.1) has produced a sensible and simply worded leaflet (No. 87, "To Hosts and Guests") which it hopes will help to solve some of the difficulties caused by evacuation. The key phrase of this leaflet is "Give and Take." Supplies may be obtained from the Council at 2s. a hundred. A specimen copy will be sent on receipt of a penny stamp.

Corrigenda

An error occurred in Captain R. E. BURKITT's article "Flat-foot in Recruits" at page 967 of our issue for June 28. In the paragraph dealing with alterations to boots, the phrase "I had a rise of one-quarter of an inch or one-third of an inch put on the under side of the heel and sole of both boots" should have read: "I had a rise of one-quarter of an inch or one-third of an inch put on the *inner* side, etc."

In Captain WILLIAM E. SMITH's paper on the control of gastric hyperacidity and peptic ulcer published in the *Journal* of July 5 (p. 13) two corrections were received too late owing to delay in the post: (1) Page 13, column 2, line 39—for "reference" read "inference." (2) Page 14, column 1, line 15—for "9" read "10"; and column 2, lines 1 and 8—for "4" read "5."